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ENGINEERING FINANCE COMMERCE

THE FULL RICE BOWL

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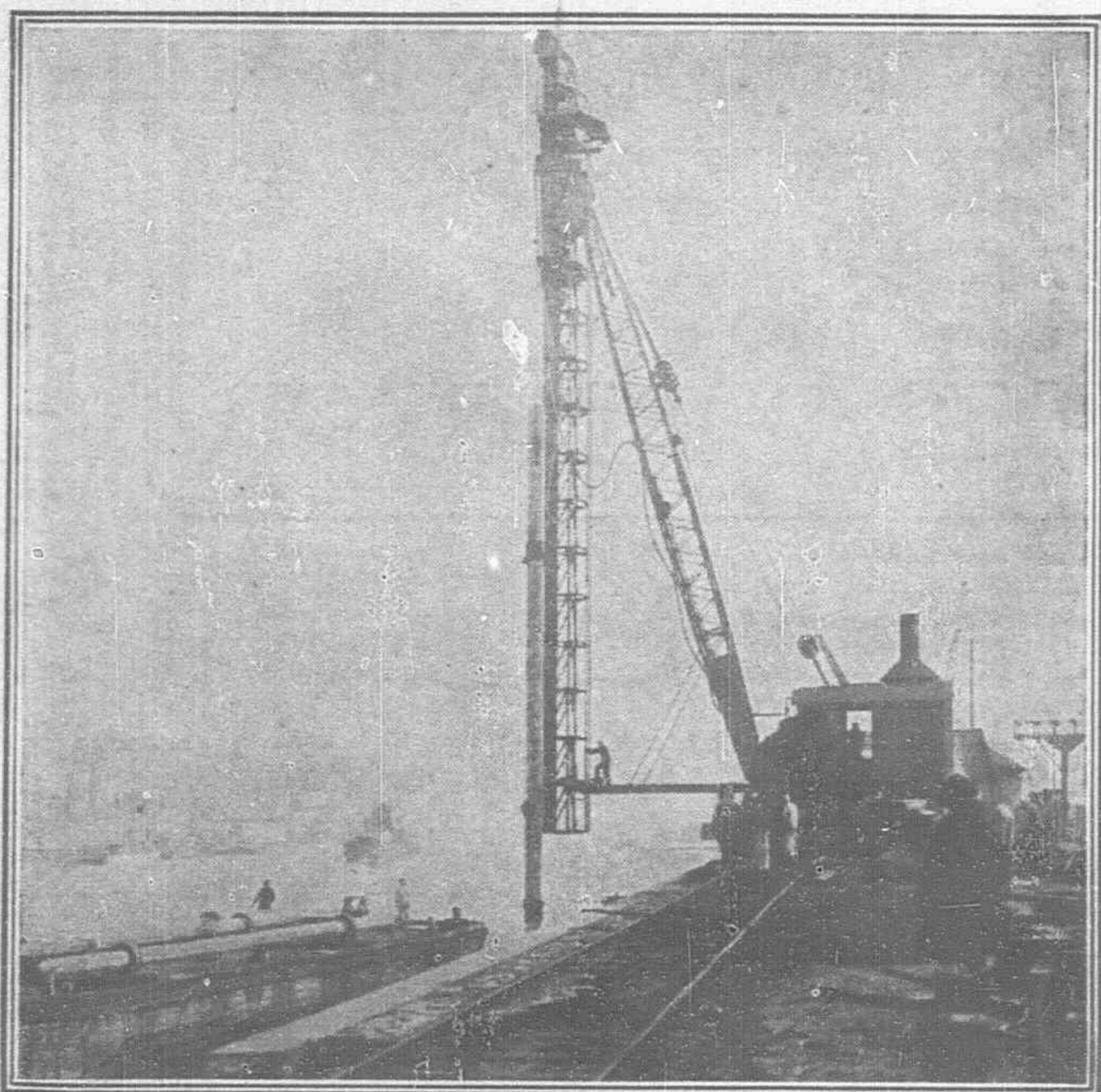
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The Full Rice Bowl

Common Sense, Humanity and Practical Christianity Applied to the Boxer Indemnity

WE realize that we stand almost alone in raising a voice against the present trend of America's general uplift program in Asia and anticipate that our temerity in going against the popular will may call down on us the displeasure of that influential element whose combined activities, organized under powerful federations, command the respect of the financial, business and political world. However, we will say at once that we do not disagree with the underlying principles which guide their work nor do we minimize or detract from the merits and importance of their praiseworthy aims, but we do emphatically believe that the whole thing is being overdone to an extent that the material well-being of the living generation of Asiatics is being sacrificed to the objects of a campaign whose benefits will not be visible in this world of sorrow for many decades to come.

The American Policy

In the long run the philanthropic policy of America towards China will probably work out as the best for all concerned. While heartily approving any program that will help to wipe out the abysmal superstition and ignorance pervading the great masses of China, common sense tells us that this is a task which can be successfully undertaken only by the Chinese themselves. The present tendency on the part of western nations to win the confidence, esteem and gratitude of the Asiatic through elevating his educational and moral status while most commendable, takes no heed of his immediate economic necessities. The question as to whether our first duty is to improve his economic status as a foundation on which to erect a permanent political structure or whether his cultural and political education should take precedence, is a matter of opinion.

THE FAR EASTERN REVIEW adheres to the doctrine that when a man's material comforts are assured he is in a more receptive mood to acquire learning. Unless he can find profitable employment it seems unwise to elevate his cultural status to a point where he becomes discontented with his lot and unmanageable politically. The Philippines are a case in point. Here, America has elevated an Asiatic people—who resent the imputation of ever having been "backward"—to a high level of political self-sufficiency but has failed to create opportunities for their employment. We have erected an imposing political structure on a foundation of sand and when the props of American support are withdrawn the edifice will collapse like a house of cards. The logical outcome to our experiment in the Philippines is political unrest, discontent and an incessant clamor for independence. The Filipinos don't like us and don't want us and lose no opportunity in telling us so.

The same system is working out along somewhat similar lines in China where millions of American dollars are being annually poured into the country for general uplift work but not one cent is forthcoming to fill the rice bowl through the creation of industries or the building of railways. The advocates of education as the only safe way to elevate the status of the Chinese have the public ear. They dominate all bodies that make public opinion and through an unrelenting propaganda in the press, pulpit and halls of congress have convinced the American government and people

of the soundness of their viewpoint. It is not a pleasant task to disparage a movement which exerts such influence on our national activities in this country, as there are more Americans engaged in the various fields of uplift work than there are employed in the legitimate pursuits of trade. Their work has developed into a highly organized, skilfully directed and prosperous industry, supported by the contributions of the American people. It is not to be wondered at that the remission of the American portion of the Boxer indemnity should have provided for its use in cultural uplift, nor is it strange that the policy of the American government has become unalterably fixed along these lines. No amount of common sense, comment or criticism can effect any change in a policy deep-rooted in a religious fanaticism that spreads to every parish in the country. The political power exerted by this movement is too strong for any popular government to ignore or oppose. The huge vested interests of the missionary and educational bodies operating in China and their wide-spread, multitudinous and ever-growing activities call for an expenditure which increases of its own weight and momentum like the proverbial snow-ball. It is difficult to see where it will stop, where a halt will be called to the emotional insanity which now subscribes over \$15,000,000 gold annually for uplift work in China. Each year the call for more funds becomes greater and every cent must come from the pockets of the American churchgoer supplemented by donations and endowments from the rich who are easily persuaded of the truth of the biblical proverb concerning their inability to pass through the eye of the needle with the load they have accumulated.

There is a possibility that the whole movement may collapse of its own weight. Only recently a world-wide commission was appointed by the world federation of education associations for the removal of illiteracy throughout the world. As far as China is concerned, the slogan is "China a literate nation in one generation." Most commendable, but where are the funds to come from? The slogan, however, may refer to the next generation or the one following it. Are Americans to be called upon to furnish the millions required to defray the costs of a movement whose financing properly belongs to the Chinese government? Undoubtedly there will be many high-salaried positions connected with this campaign that will be filled by professional American uplifters and paid for by the American committee, but who will carry the load of establishing the schools and paying the salaries of the teachers throughout China? The new movement has taken on a herculean task but one thoroughly in line with the prevailing American idea that we can regenerate the world, ignoring our experiment in the Philippines as a sample of what we will accomplish in China unless the economic needs of the people are given precedence over their cultural welfare.

The British Attitude

It is refreshing from our viewpoint to turn from this wave of educational fanaticism to the most recent manifestation of British opinion on the subject of the proper disposal of the Boxer indemnity funds. It is gratifying to learn that the great federation of British industries has reversed its original opinion concerning the disposition of Britain's share of the Boxer indemnity. Although the federation had originally advocated that the remitted funds be

expended for educational purposes, it modified its views after consultation with responsible Chinese public men and in agreement with public opinion in this country. It now considers that the further education of Chinese students on western lines a debatable matter, endorsing the opinions expressed by THE FAR EASTERN REVIEW that in the present condition of China, these highly trained technical graduates find no opportunity of utilizing their training. Reading between the lines of the telegraphic dispatch announcing this change of front, it can be readily seen that as soon as the federation heard the other side of the long-drawn propaganda of the educational enthusiasts, the common sense of the British manufacturer told him that the greatest educational benefits and general uplift of the masses of China could come only through the betterment of their economic condition, through the creation of industries that would follow the extension of railway transportation facilities.

The federation has accordingly issued a statement asking the government to adhere to the undertaking of their predecessors that industry would be represented in the committee established to decide the purpose to which the Boxer indemnity should be put. If the British chambers of commerce and other organizations in China now take a similar common sense view, it may not be too late to tie a can on the tail of the emotional campaign for education and influence the adoption of a program that will bring immense trade benefits to the community through railway construction, and if properly directed, the movement might compel Peking to give tardy approval to the scheme for the extension of Shanghai's harbor.

With British industry seeking markets and outlets that will provide work for the masses of unemployed and with a long period of business depression staring their traders in the face in China, it would seem that self-interest would influence the British bodies in this country to follow the lead of the federation and support its demand that industry be represented on the committee to decide upon the manner in which the Boxer indemnity is to be expended. In any such program, British industries would benefit exclusively from the supply of materials and enable the British merchant in China to carry on through the impending trade depression. There is a time when nations can afford to be altruistic. There are also times when their own interests become paramount. This is certainly no time for Great Britain to emulate the example of America and enter into any competition with professional political philanthropy.

The Chinese View Point

THE FAR EASTERN REVIEW is not particularly concerned or interested in the outcome of the present inter-*tuchun* struggle in China except to hope that whoever comes out victorious may establish a government that will bring contentment and prosperity to the people. We have consistently condemned General Wu Pei-fu's program to unify the country by the sword, believing that China has progressed too far along the road of self-government to check the movement by force. However much we may disagree with Wu's political program it does not deter us from heartily commending and supporting his views for the utilization of the combined Boxer indemnities for urgent railway construction. We can readily see how the immediate construction of certain important railways would greatly strengthen General Wu's strategic position and chances of ultimate success, but after all, this is a long way off and before the railways are in operation there may be a radical change in the complexion of China's government. On the other hand, the industrial and economic benefits accruing to the country and its people by the completion of these urgent trunk lines far outweigh in importance the temporary military benefits to any individual *tuchun* or combination of *tuchuns*.

General Wu's plan to allocate the Boxer indemnity funds for railway construction and employ the revenues from these railways for the maintenance of schools is eminently sound, and should merit the support of every foreigner engaged in business in this country. The fact that not one foreign commercial body, chamber of commerce or other organization has come out in defense of their own interests by passing resolutions in support of General Wu's program, is a clear indication of the hold the educational and philanthropic interests have on the foreign community and their organs of public opinion. (The American chamber of commerce at Hankow has recently endorsed Wu Pei-fu's program.) General Wu's views on this subject are worth repeating. He invites attention to

the basic truth that the indemnity is contributed by all classes throughout the country. The Tsing Hua College, supported by part of the indemnity funds returned by America, has been instrumental in educating a good many useful sons of China who are rendering good service. In spite of its usefulness General Wu says that in the main only sons of officials, or men of influence, had been admitted and that among students of the same standing and class seeking admittance with a view of gaining higher education in America, the sons of officials and men of influence have better chances. This, the Marshal said, was wrong, as many of the poorer class have had no hope of ever enjoying the privilege.

On the other hand, if hard and fast rules are laid down for the revenues from the railways to be applied for educational purposes, it means that as long as these railways are in operation, there will be funds to educate the masses.

"I am in favor of establishing as many schools in the interior as the revenues from the railways permit," the Marshal continued, "so that the poorest can be benefited. The rich can look after the education of their children, but the poor cannot. The greater portion of the Boxer indemnity is from the poor classes. Not only this, but the railways thus constructed will open the country, and benefit the masses. If my views are followed, it means that the well-to-do class will have a chance of acquiring a better education abroad, while the poorer class will at least have a preliminary education at home which will make them better Chinese citizens and more competent to have a voice in their own government."

These same views are supported by other far-seeing Chinese public men, amongst these, Dr. C. T. Wang, as president of the national association for road improvement, comes out strongly in favor of General Wu's plan, urging that all returned portions of the Boxer indemnity be used for railway construction instead of using the funds exclusively for educational purposes. In a memorial to the government and other commercial organizations throughout the country, Dr. Wang, after pointing out the advantages of General Wu's plan, asks the pertinent question: "If the returned portions of the Boxer indemnity are to be devoted to education alone, which is in itself not a productive or profit-earning enterprise, what is to become of education in China when all these funds are exhausted?"

It is quite apparent from this question that Dr. Wang had not yet learned of the American plan to make "China a literate nation in one generation," so he goes on to say that "On the other hand, if the returned portions of the Boxer indemnity are all invested in railway construction, the educational funds of the country can depend upon the incomes of the lines built. Such an arrangement, the wisdom of which cannot be questioned, is nothing less than finding a permanent endowment fund for Chinese education in future." Now, if the world federation of education associations honestly hopes to make good on its slogan, the plan proposed by Wu Pei-fu merits its immediate approval. It seems to be the only feasible way in sight for the next ten to fifteen years to finance their campaign. It would be interesting to know just what reaction Wu's plan has upon the educational enthusiasts of the federation.

General Wu's plan has also received the approval and support of many other Chinese leaders, opposition arising only from Dr. Sun Yat-sen who seems to see in this use of the Boxer funds a means for strengthening the power of the northern militarists, but if a large part of the funds are employed to complete the unfinished portions of the Canton-Hankow railway, there should be no reasonable complaint on strategic grounds, as it gives to each rival an equal opportunity to utilize the road for military purposes. If the building of railways will help to put an end to inter-provincial strife and make for unification, the sooner they are built the better.

On the other hand, Dr. Sun Yat-sen, representing the provinces south of the Yangtze, has a legitimate cause for complaint when control over the expenditure of the remitted American portion of the Boxer indemnity is vested in a committee composed in its entirety by office holders serving under the Peking government and sworn to uphold the Chihli party. It is a foregone conclusion that not one cent of these remitted American funds will find its way south of the Yangtze. This one fact would seem to justify Dr. Sun Yat-sen's accusation that the northern militarists are seeking to appropriate for their own purposes the various remitted Boxer funds with no reference to the rights or wishes of those provinces whose revenues make up the bulk of the indemnity. In the event of a break-up of China into independent states it is a certainty that the powers would demand that

each seceded state would take over its proportionate share of the debt incurred by the previous central government, in the same manner that England recently demanded that the newly created state of Iraq take over its proportionate share of the old Ottoman debt. The rule works both ways and in any remission of funds contributed by all the provinces of China, it is the duty of the powers concerned to see that its expenditure is evenly distributed so that all will share alike in its benefits.

From this point of view the handing over of a national revenue contributed by all the people of China to any one faction temporarily recognized by the powers for the sake of expediency, at a time when the country is split wide open by civil war, provides the southern leaders with sufficient cause to charge the powers with a flagrant breach of neutrality in the internal affairs of China. Up to the present, however, the only nation which has committed itself along these lines is the United States, and the time has arrived when Americans in China must give serious thought to a situation in which their national prestige and usefulness is impaired through the blind fanaticism of educational enthusiasts overlook in their zeal the larger problems involved in these infractions of international law. The present disregard for treaties and the rights of foreigners in China may in large part be traced to America's violation of the spirit of the Boxer protocol which for all practical purposes emasculated this instrument of its efficacy. Again, in the recent remission of the balance of the American portion of the indemnity, the educational enthusiasts scored a victory for the advancement of their own special ends without any thought or consideration of how it will affect the internal struggle in China or the interests of the American business community on whose shoulders fall the difficult task of translating our altruism into practical benefits that will help to maintain the standards of living at home which alone permits the nation to indulge in its philanthropic eccentricities.

It is not too late for the American business community in China to break away from the leading strings of the educational fanatics and join with the British in demanding that industry be represented on the committee for the final disposal of the Boxer funds. The associated American chambers of commerce in China, carried away by the appeal of the altruists, went on record last

year recommending the return of the indemnity for educational purposes. The British commercial community alarmed at the growth of American prestige through the application of their educational system were also stampeded into endorsing a similar program. The result is before us. We looked for gratitude and have found it in the northern military camps, amongst a party whose fixed policy from the time Yuan Shih-kai assumed dictatorial powers, has been to deny to the south any appropriation of public moneys that might develop its transportation and resources and enable that section of the country to more adequately and forcefully assert its right to a square deal in government. We have earned the gratitude of Peking but incurred the undying hatred of the south, of Manchuria, and of the other independent provinces.

This is no time for foreigners facing a prospective period of business depression in China to further sacrifice their own interests by endorsing a program that will deprive them of an opportunity to tide over a protracted crisis by the use of the Boxer funds for railway construction. It is no time to further antagonize the peoples of provinces who hold themselves independent of Peking. It is time for the application of common sense ideas and it is to be hoped that the leaders of the foreign business communities throughout China will avail themselves of the opportunity still afforded to revise their views on this matter.

They could recommend to their governments that no portion of the returned Boxer indemnity funds be released for expenditure until unification be effected. The release of the funds could be made conditional on the calling of a conference to bring this about. This method of intervention in the affairs of China would be strictly within the limits of international law and welcomed by all parties who seek a solution of the present situation other than unification by the sword. Foreign endorsement of General Wu Pei-fu's program to use all the remitted Boxer funds for railway construction whose revenues will create a permanent fund for the maintenance of schools would seem to be the most effective one in sight and one that will bring ultimate success to the educational movement. The plan will be reciprocal and bring adequate returns to a long suffering commercial community which has passed through a prolonged trade crisis during which many a good firm has gone under while their interests have been ignored in order to placate the inordinate demands of a worthy but ill-timed crusade.

Prostituting Extraterritoriality

Legalizing the Sale of Protection to Chinese Citizens

A Practice Involving the Ownership of Foreign Newspapers in China Prejudicial to All Foreign Interests

The facts, only partially disclosed in the following article, have such a vital bearing on the position of the foreigner in China, that it is the duty of those governments enjoying extra-territorial privileges to protect their prestige and preserve the treaty rights of their law-abiding citizens by starting a searching investigation to ascertain the truth. Unless we are to be hoist by our own petard in the campaign for the abolition of extra-territoriality, it is high time for the foreign commercial community to demand that a stop be put to practices which jeopardize their position under the treaties. The American government maintains a district attorney attached to the United States court for China whose duty it should be to discover the facts and prosecute offenders against the law. Other governments have similar officials for enforcing respect for the treaties. As long as this local machinery of justice fails to function, we cannot expect the home governments to move in matters which so vitally affect the interests of their citizens or subjects in China. If extra-territoriality is to be preserved, a stop must be put to these practices.

IN a forceful editorial on the duty of foreigners to maintain neutrality in the present unfortunate civil war in China, *The North-China Daily News* denounces as iniquitous the practice of registering Chinese citizens in the consulates of foreign countries. This abuse has been carried to extreme lengths in many foreign concessions while Tientsin, says the *North-China Daily News* has become a regular re-

fuge for fugitive militarists and politicians who pursue their intrigues against the recognized government from the safe precincts of its foreign concessions to the general detriment of China, a situation intolerable to the Chinese and to all right-thinking foreigners. Concluding its justly severe condemnation of these practices. *The North-China Daily News* says: "But while Chinese can buy patents of foreign nationality for a sufficient number of dollars,

though they never have been within hundreds of miles of that nation's territories, while property can be removed from Chinese jurisdiction by registration under a foreign flag, while defeated militarists can lie snug and secure within the boundaries of a foreign concession, the Chinese people have a just cause for complaint. A great wrong is being done to the cause of all foreigners in China, the innocent with the guilty, between whom the Chinese cannot be expected to distinguish and it is urgently necessary that the powers shall take notice of these abuses and make them cease."

In these words, our British contemporary sounds the key-note to a campaign that should merit the earliest attention of the diplomatic body at Peking as a prelude to opening the question of the abolition of extra-territoriality, an issue that must be faced as soon as China settles down under some stable government which can take upon itself the obligations incurred under the Washington treaties. Unless this is done and an honest effort made to clean up a nauseating mess, the foreigner is simply arming the Chinese with arguments that will later be employed to deprive him of his privileges. THE FAR EASTERN REVIEW heartily supports the views of its contemporary and emphasizes the real danger to all foreign interests in China arising from the wholly indefensible practice of registering Chinese properties and enterprises in some foreign consulate, either to obtain protection in return for so many dollars paid over or camouflaged under the name of some complaisant national whose respect for his flag has little in common with the higher interests of his own country. While such practices come immediately under the severe denunciation of *The North-China Daily News*, other uncommendable though perhaps more legitimate methods are resorted to in order to conceal Chinese participation in foreign registered enterprises behind the names of foreign trustees who stand before the public as the real owners of the stock. There seems to prevail in Shanghai a nice distinction in the ethics concerned in these matters, denunciatory on the one hand where it pertains to registering Chinese citizens and their properties in return for a stipulated price and somewhat eulogistic in regard to circumventing the conventions by concealing the names of majority shareholders in enterprises financed by parties not entitled to the protection of the flag under which registration is conceded. Sooner or later, this question must receive the attention it deserves, if the rights of foreigners in China are to be respected by the Chinese people and their authorities.

Our views on this matter have been considerably strengthened after reading the testimony in the recent suit against *The China Press* brought by its former editor for breach of contract. The evidence as to the ownership of this newspaper accentuates a very pertinent question that came before the last annual meeting of the American chamber of commerce of China at which time it was ruled that once a company acquired American registration nobody had the right to inquire into the nationality of its majority shareholders by going behind their trustees or figure-heads. This decision seemed to imply a condonation of practices which the chamber as a whole would have been the first to discourage had the opportunity been conceded to properly ventilate the question before the meeting. The ruling shielded an American incorporated enterprise operating in Shanghai from the necessity of revealing the names and nationality of its original majority shareholders and so guaranteed the right of one of the minority shareholders to a seat and voice in the direction of the chamber's affairs. The matter was one calling for most serious consideration, as behind the original question arose the larger and more vital one involving the possibility of private Chinese capital or official funds and subsidies being secretly employed in financing an outwardly legitimate American enterprise, giving to the American figure-heads the right to a seat in the chamber and a voice in drawing up its resolutions.

It is of interest, however, to know that this ruling is not endorsed by the American consul-general who holds that incorporation of a company under the laws of any of the many states does not of a necessity entitle it to registration in the consulate without proving to the satisfaction of the consular authorities that the majority of its shares are owned by *bonâ-fide* American citizens and purchased with their own funds. On the other hand, the ruling of the chamber would seem to stand as an open invitation to the Chinese to use American citizens as trustees for their holdings in corporate American enterprises, guaranteeing protection of the flag without any possible chance that the right to such protection may be publicly challenged. A premium is placed upon this evasion

of the law by the regulations in force at the American consulate. In Hongkong it is possible by the payment of a small fee to the registrar to have immediate access to the records and annual reports of any company registered under the Hongkong companies law. In any state in the United States it is possible to consult the official records without the payment of this fee. In Shanghai, however, the utmost secrecy is maintained at the consulate registry office in regard to the official records of incorporated American companies. It is entirely out of the question for the ordinary citizen to obtain access to the reports filed according to law with the consulate, yet these same reports are open to any one who may ask to see them in the departments of the states under whose laws the company may be operating. The system applied at the American consulate and the ruling of the American chamber of commerce therefore acts as a perfect shield against the investigation of corporate enterprises whose majority stock may be owned by foreigners represented in the records by American dummies. The operation of this secret system amply protects those who desire to evade the law and makes it possible to ascertain the facts about such enterprises only when the interested parties are placed on the witness stand under oath to tell the truth.

The practical operation of such a system would make it feasible for Chinese political enterprises—amongst which can be classed the newspaper organs of the various *tuchuns* and factions—to safely flout the Chinese laws and public opinion and carry on pernicious activities against the recognized government from the safe refuge of a foreign settlement without fear of confiscation or penalization. The system makes the American dummies of these Chinese politicians eligible to membership in the chamber of commerce and to a seat on its executive committee where they can pass resolutions and wire them on to Washington as representative of American opinion.

That these methods are being employed to conceal the identity of the real ownership of foreign newspapers would seem to be clearly established by the testimony in the referred to suit against *The China Press*. The facts brought out in the evidence submitted at this trial show that *The China Press* is an American enterprise incorporated under the laws of Delaware and although it does not appear in the testimony, it is easy enough to prove that amongst its original shareholders was the imperial Chinese government which subscribed to \$40,000 or \$60,000 of the capital stock and placed its holdings in the hands of the late Wu Ting-fang as trustee. From its start, therefore, *The China Press* was a Chinese-American enterprise in which the Chinese official stock holdings were concealed under its American registry.

The testimony at the trial discloses that in due course, the property came under the control of the late Mr. Edward Ezra, a British subject, who owned over sixty per cent. of its shares. The newspaper was then included in the assets of the Shanghai Hotels, Ltd., a British registered company and after Mr. Ezra's death taken over from this company by the Ezra estate. All this time the newspaper enjoyed its American registry and a seat in the councils of the American chamber of commerce.

The evidence at the trial furthermore revealed that early in 1923 a new board of directors assumed control over the management of the newspaper in which the chairman of the board and three of his associates were prominent Americans residing and doing business in Shanghai. It does not appear from the published testimony that there was any actual transfer of a controlling interest that would justify such a radical departure from traditional methods in corporate company management, but there is a guarded line or so in the summing up of the judge which clarifies this matter by referring to the time when the newspaper was under Chinese control in the summer of 1923.

It would appear from the evidence that some time last year the newspaper came under Chinese control and during this period as far as the public was concerned its management and policy were dictated by a board of directors including four Americans and two Chinese, with the power centered in the American members of the board. From reliable sources it is learned that some time early in 1923 a group of Chinese largely composed of *tuchuns* and prominent officials, obtained an option to purchase the newspaper from the Ezra estate and paid over the first installment of the purchase price. The group obviously intended to control and dictate the policy of the newspaper through the American chairman of the board and his associates, remaining in the background screened

effectively from the public by this directorate of minority American shareholders. The Chinese failed to execute their option by paying over the second installment of the purchase price on the due date, and two of the American directors, one of which was the legal trustee for the Chinese funds, resigned their seats on the board and the management of the property reverted to the Ezra estate, which appointed Mr. Arthur Sopher, a French protégé, to represent its interests. Yet it would seem from the evidence submitted at the trial that direction over the policy of the paper remained with the American chairman of the board, who never stepped his foot within the office for the year and a half he acted in that capacity.

Altogether, the facts established by the testimony at this trial disclose the rather edifying picture of an American incorporated and registered enterprise enjoying membership in the American chamber of commerce, controlled first by a British subject, then by his estate represented by a French protégé, under option of sale to a group of Chinese war-lords and politicians who camouflaged their holdings behind an American board of directors. To heighten the illusion the editor and reporter staff, were, in the main, American. This chameleon of the press posed before the public as the exponent of American ideals and the organ of American interests! The connection between the facts revealed at the Webb trial as to the real ownership of *The China Press* and the ruling made at the last annual meeting of the American chamber of commerce is so obvious that no comment is necessary.

Now, we invite attention to this state of affairs, as an illustration of how legitimate all this widow-dressing of Chinese enterprises with American drapery has become in the conception of the most respected members of the American community. Instances may be cited by the score where Chinese properties are held in trust by the subjects or citizens of foreign countries now enjoying extra-territorial privileges and registered in their respective consulates under their own name. Selling protection to the Chinese in some form or other seems to be a recognized business, well within the law and sanctioned by many precedents. In fact, if reports are true, there have been many large fortunes made in this highly respectable manner. It is said that a large proportion of the Chinese-owned property in Shanghai is registered under the name of some foreigner who acts as trustee and that this system has given to certain individuals a prominence in the affairs in the settlement which rightfully should not be theirs. As to the truth of these matters, however, we have no direct proof, but so long as such practices endure and are condoned by public opinion, we heartily agree with our British contemporaries that the Chinese people have a just cause for complaint. The innocent foreigner in China to further the interests of trade has even a more legitimate right to voice a protest against acts which place in jeopardy the interests of the foreign community as a whole.

At a time when the question of the abolition of extra-territoriality looms ahead as the next and most vital phase in China's long-drawn-out fight to recover her sovereign rights, the secret manipulation of newspaper ownership which may hand over to Chinese control the organs of foreign public opinion, becomes a matter of great importance to every foreigner in China. We are informed on the highest authority that the Chinese group interested in the purchase of *The China Press* was purely national in its make-up, including such names as President Tsao-Kun, General Wu Pei-fu, Dr. Sun Yat-sen, Dr. C. T. Wang, Mr. Alfred Sze and several others. Common sense should tell us that when the heads of the warring factions in China sink their mutual hates and come together to finance a foreign newspaper to be directed by the most prominent members of the foreign community, that their main objective is to control an organ of foreign public opinion during the strenuous campaign that China was proposing to launch last year for the abolition of extra-territoriality. There was only one other common impulse that could have brought these irreconcilables together in such a common cause and that is the continuation of an anti-Japanese propaganda that would have helped them in the proposed fight to recover sovereignty over the Kwantung peninsula.

The facts surrounding these manipulations of stock ownership and registration of Chinese citizens and their properties in foreign consulates is a matter which calls loudly for official investigation by our state department officials and a more rigid application of the laws and regulations which cover these violations of the spirit of the treaties with China. When the most

highly respected and prominent men in the foreign community—and this applies to all nationalities—lend their names to such artifices, no matter how well within the law they may be, and public opinion condones their acts, we must not be surprised if others lower in the public esteem overstep the legal bounds and bring discredit on the whole foreign community. As it stands the leaders we look up to defend the position of the foreigner and preserve our extra-territorial privileges until such time as China can be trusted with full sovereignty over our affairs, are now thoughtlessly perhaps, but nevertheless forcibly providing the Chinese with unanswerable arguments that will seriously undermine our position when the fight for the abolition of extra-territoriality is resumed.

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The China Press of October 16, fully endorses the views of *The North-China Daily News* and *THE FAR EASTERN REVIEW* in denouncing the general practice of prostituting extra-territorial privileges and breaking down the position of the foreigner in China, in so far as it pertains to providing a safe refuge for political refugees and trouble makers within the foreign settlements. This appreciation of the danger to all foreign privileges was influenced by the report that General Hsu Shu-tseng, "Little Hsu," had taken over command of the Chekiang army after the flight of its former leaders. *The China Press* says:

"Foreigners are very apprehensive regarding the status of their extra-territorial rights, but by permitting political refugees of the Little Hsu type to enter the settlements and continue their p'ottings within the shadows of the foreign consular flags, they are thus breaking down their own cause on behalf of extra-territoriality."

"The foreign powers on many occasions in the past have considered this matter of permitting outstanding political refugees against whom warrants have been issued by the Chinese governments to live in the settlements, but nothing has been done to stop the abuse of the settlements because of the old story of failure of the powers to agree on the matter. The present incident should cause serious reconsideration of this vital question and in making this statement we are not intentionally 'aiding and abetting' one side of the present struggle to the detriment of the other. The same thing applies whether the political disturber comes from Peking or Canton."

The argument applies with equal force to the other abuses against the rights of foreigners mentioned above. If conditions, however, were reversed and General Wu Pei-fu and his appointees (to use the words of *The China Press* in describing the defeat of the Anfu party) were in turn "kicked out" of Peking by Marshal Chang and his allies, we doubt very much whether the procedure advocated would be applied. We recall many previous occasions in the recent history of China where "traitors" to the Peking government were acclaimed as patriots and protected by foreigners. We recall Yuan Shih-kai's sudden flight from Peking after the death of the empress-dowager, when the edict had gone forth for his arrest. We recall that he fled to the safe protection of the British concession in Tientsin and that it was largely due to the influence of the British legation that his life was spared and he was permitted to retire to his home in Honan and nurse his "sore leg." We recall that Sheng Kung-pao was characterized as the greatest "traitor" of all, when he proposed in 1911 to unify the railways under state control, yet this did not prevent sympathetic friends in the American legation from extending protection and providing him with an escort to Tientsin from whence he sailed for Japan to spend the rest of his years in exile. We recall that when Chang Hsun was defeated in his attempt to restore the monarchy that he performed a marathon with the Dutch legation as his goal. We also recall that when Yuan Shih-kai dissolved parliament and denounced the Kuomintang leaders as "traitors," that Dr. C. T. Wang and some of his associates were escorted to Tientsin safely under the protection of British friends. The Japanese legation in like manner opened its doors to its friends in the Anfu government when it was overthrown by the Chihli party and declared "traitors." And so it goes. If Wu Pei-fu and his appointees who have received the support and recognition of the powers and the plaudits of the foreign press for the past three years should now in turn be defeated by Chang and proclaimed "traitors" to the republic, we have no hesitation in prophesying that in such an event his foreign friends and admirers would be the first to welcome him to a safe refuge in the international settlements of Tientsin or Shanghai and eulogize him as a martyr to the cause of good government in China.

The War in China

Japan's Absolute Neutrality and Determination to Avoid International Complications: Soviet Activities

THE war in China is still dragging along. Up to date its progress is fairly well covered in a general way by the description of Chinese military tactics so faithfully portrayed by Mr. J. O. P. Bland in his book, "Houseboat Days in China," reprinted in the September number of THE FAR EASTERN REVIEW. The salient feature of the early stages of the war was the betrayal of Marshal Lu Yung-hsiang of Chekiang by two of his generals on the Fukien border which forced Lu to fly from his capital at Hangchow and take refuge with his troops in the field at Lunghwa, near Shanghai. This traditional Chinese manoeuvre was duplicated this month by the further betrayal of Marshal Lu when another of his division generals refused to continue the fighting on the Tsingpu front. In this, the mutinous general seemed to have the support of other members of Lu's immediate *entourage*, so sensing that he had been sold out, Lu, made a hasty night retreat into the international settlement boarding the N. Y. K. express steamer leaving the next morning for Japan. He is now in that country and his armies in the trenches around Shanghai are without a leader. The war in the Shanghai district is practically over.

In the north the war between the better trained and equipped troops of Marshal Wu and Marshal Chang has produced some severe fighting but the stories trickle through from Tientsin and Peking that several of Wu's trusted generals have been bought over by Chang and his ally, Marshal Tuan Chi-jui, the leader of the Anfu party. The Christian General, Feng Yu-hsiang, one of Wu's stalwarts, is described as sitting on a fence refusing to take sides, evidently waiting to see which way to jump in order to land safely on the bandwagon of the victor, or, he may be patiently awaiting his share of the common treasury loot for the payment of his soldiers. If these reports are true, then Marshal Wu is getting a dose of the same medicine he administered to Marshal Chang two years ago when two of the latter's trusted generals went over to the other side in the heat of the battle for the possession of Peking. This treachery gave Marshal Wu control over Peking, and as the foreign powers adhere to the policy that whoever holds Peking is the *de facto* government of China, it has enabled Wu's appointees to entrench themselves in power and collect the surplus handed over by the powers in control of the customs and salt revenues.

Meanwhile, the war in the north goes grimly on and it is only fair to state that the Chinese soldier has exhibited wonderful courage and withstood punishment under concentrated machine gun fire that decimated whole regiments and battalions. It is the first time the Chinese fighting man has gone up against modern artillery and implements of war. He has stood the test in a manner which elicits the highest commendation. If these men are ever animated by a love of country or some impelling ideal the world may well tremble for its peace. It may be that the individual Chinese is a pacifist and will lead the world in finding a way towards universal peace, but if this war means anything at all it means that the Chinese are changing. They have had their first test and in the main have stood up well and realize their power. Given a worthy object to fight for and a united nation behind them, their next foreign war will surprise the onlookers.

It is too early to express any opinion as to the final outcome of this sordid struggle for power. Intelligent foreigners have lost interest in the petty issues which divide the rival factions and would welcome almost any settlement that will put an end to a situation that is fast driving them into bankruptcy.

Japan's Absolute Neutrality

One feature of the war cannot but fail to command attention. The world moves and for once in recent years, Japan has escaped the accusation of having aided or abetted any one faction. The only newspapers which have tried to connect Japan with the present upheaval are those owned by Hearst. This need not be taken seriously, however, as Hearst seems to have made it his particular

hobby and business to provoke and worry Japan and the Japanese are so used to it by this time that if he stopped picking on them they would feel like a dog which had lost its pet flea.

There was a time not long since when nearly all foreign newspapers in China were ready to lay the blame for all of China's woes on Japan. This attack of Nipponophobia has passed. Even Hearst's prototypes in the foreign newspaper field in China are unable to work up a serious argument or cite any incident that might in the most remote manner connect Japan with the present trouble. The Chinese native press, in the past suspicious and abusive of Japan, has come to its senses and in commenting on the present situation has been extremely fair and moderate in referring to Japanese policies. Nearly all the better class Chinese newspapers praise Japan's attitude in preserving a strict neutrality and admit the justice of her announced intention to take action only if her vital interests in Manchuria are jeopardized by actual fighting in the S. M. R. zone. Other Chinese see in the present civil war an opportunity to improve the friendly relations now existing between the two peoples.

The only direct accusation that Japan has violated her neutrality arises from the fact that the Japanese owned South Manchuria Railway has transported Chang Tso-lin's troops from northern Manchuria to southern Manchuria points, an obligation that could not well have been escaped without raising more serious questions. Refusal on the part of the S. M. R. officials or the Japanese government to permit the use of the railway for transporting Chang's army would probably have resulted in the seizure of trains or damage to the track and bridges on the part of infuriated Manchurian soldiers, compelling Japan to send a large force for the protection of the line, a wholly unprofitable undertaking. The Japanese government rightly claims that the granting of permission for transporting Chinese troops over the S. M. R. is in accordance with precedents and does not in any way constitute a breach of neutrality in China's civil war.

In the same manner that the Japanese line moved Chang's soldiers it would carry Wu's troops should they be victorious. During the war between the Chihli and Anfu factions a few years ago, the S. M. R. transported soldiers belonging to the same Mukden party but no protest was made by the Peking government solely because it was allied with Marshal Chang at that time. At any rate the official statement has been made by the S. M. R. authorities that Chang's soldiers were transported before hostilities were declared, at a time when it was impossible for a third party to anticipate a war between Mukden and Chihli. The S. M. R. recognizes Marshal Chang as chief of the territory it serves and as long as Peking exerts no authority over Manchuria, it has no option but to conform to the official requests of whoever is in power at Mukden.

International Complications Forstalled

This incident opens up what may develop into the most important phase of the war, for although Japan will maintain a strict neutrality and exert all her diplomacy to prevent hostilities being carried into the South Manchuria Railway zone, she will move if it becomes necessary to protect her important interests in this territory. There is no immediate danger of a development which could only arise if Chang is defeated and his retreating forces are followed by those of Wu to any point in Manchuria beyond the Liao River. There would be ample time if this happened for the Japanese government to enter into friendly negotiations with Wu that would obviate the necessity of dispatching Japanese troops for the protection of the South Manchuria Railway. There is little reason to doubt that in such an emergency Marshal Wu would gladly give the necessary assurances that Japanese interests would be respected. When faced with Japan's determination to protect at all hazards her immense vested interests in Manchuria, it is safe to predict that Marshal Wu will be extremely careful not to precipitate a situa-

tion that might carry with it foreign intervention on a scale that would put an end to his dreams of power.

It is for this same reason that Japan will exhaust every peaceful means before taking a step which might precipitate a greater calamity upon China, for it is a certainty that if Japan should dispatch an army to defend her interests in Manchuria, other powers would repeat their Siberian blunder and ask that such intervention be made international, justifying their request on the existence of large foreign interests in the international commercial settlement at Mukden. In such an event, the same old story will be repeated. Americans will feel that they are in Manchuria solely to watch Japan. The British will work with them and the fat will be in the fire. Having such a situation in view, the Japanese government would probably ignore any communication from the other powers for common intervention in Manchuria, and go it alone. If other powers insisted upon sending forces for the protection of their interests in Mukden, that would be their own affair, in the same manner that if it should become necessary for the protection of Shanghai to police or place the Shanghai-Nanking Railway under foreign direction, Great Britain would have to take over the job in combination with those powers who sympathize with her viewpoint. Japan would take no part in the protection of this railway, respecting and acknowledging the right of the British to guard their own property interests. In the same manner, Japan would exact absolute freedom of action in whatever steps might become necessary to defend her own vital interests in Manchuria.

Trend of Soviet Propaganda

A very significant feature of the present war in China is the new trend given to international political propaganda by the re entrance of Russia into the game of diplomacy as played in Peking. In seeking for the actual causes of the war it is universally accepted that militarism lies at the bottom of the trouble. This may be the basic cause, but there exists ample evidence that the Soviet has worked on this foundation to stir up trouble to further its own ends. Since the Soviet ambassador obtained a firm foot-hold in Peking the general attitude of the Chinese government towards the foreigner has undergone a decided change. The demands of the diplomatic corps thereafter have received slight attention and to its protests for the creation of a zone of neutrality around Shanghai, the Peking government turned a deaf ear. At the very outbreak of hostilities, stories began to appear in the American newspapers that Japan was behind Chang Tso-lin and his allies, Lu Yung-hsiang and Sun Yat-sun. Simultaneously the press in Japan was flooded with the wildest inventions to the effect that the United States was supporting Marshal Wu with money, arms and military advisers. Foreign Minister Koo was reported to be in direct communication with Secretary Hughes and as a result of assurances received from the latter, Peking had decided to carry through the campaign for unification by the sword. This attempt to incite suspicion and ill-will between the two countries was traced directly to Peking and to sources of information very close to the Soviet embassy.

According to this propaganda, liberated from Soviet sources, the war was traceable directly to the desire of the arch-representative of world capitalism, Secretary Hughes, to bring about intervention in China and place her under the yoke of international finance now dominated by the American bankers. The Russian proletariat was worked up to a frenzy over this attempt to undo the Soviet treaty with China, causing the *Izvestia* to declare that Great Britain, France, America, and Japan are not merely indirectly but directly attacking the Soviet union by sending warships to Chinese waters. "It is not only military interference with China's domestic affairs, but the beginning of a new world conflict. Intervention is aimed against China and the Soviet union because we made the Chino-Soviet treaty. Great Britain, France, America, and Japan intend to partition China. What can stop them? Only the revolutionary proletariat and above all the Chino-Russian alliance."

Under official auspices the Bolsheviks have organized a "Hands Off China Society" at Moscow, which has issued an appeal to the world against the "Imperialist brigands who attack China's independence." The manifesto designates opposition to Sun Yat-sen as a new universal war, which must spread beyond China's territories. "Down with the Anglo-American, Franco-Japanese highway robbers." A member of the foreign commissariat's collegium,

Rothstein, and other prominent officials joined this clamor. Rothstein officially declared that Great Britain armed the anti-Sun Yat-sen party from Hongkong arsenal, and Britain threatened to interfere at Canton if civil war began there, but the Soviet union protests with every fibre of her being against this intervention, which involves the whole Soviet position in the Far East.

As a result of this Soviet propaganda, opinion in Germany sees in the civil war raging in China the first act in the tremendous revolt of Asia against Occidental domination, especially against the Americans and British.

The writer of a striking article, covering most of the first page of the *Deutsch Zeitung*, declares that Japan and Soviet Russia are busily pulling strings in China for the purpose of bringing about an alliance with the latter which shall eventually drive Occidentals out of Asia.

The United States and Britain, continues this writer, are already taking steps to thwart this scheme. According to this theory, Japan first favored Chang Tso-lin, the Manchurian war lord, but later decided to support the central Chinese government in Peking, believing that a strong centralized China, with Peking as the capital, would be the most valuable ally for Japan and Russia. Thereupon the United States and England, it is asserted, decided to back Chang Tso-lin, and England sent him large quantities of arms and munitions to help him in trying to overthrow the Peking government.

The moves now on near Peking and the battles near Shanghai will decide China's fate. It is declared in other words, they will determine whether the United States and England, through a victory by Chang Tso-lin, will forestall the attempts to oust them from the Far East, or whether Japan and Russia, through the victory of the Chinese republican forces, will bring nearer the day when a triple alliance of Japanese, Russians and Chinese will throw down the gauntlet to Americans and Britons and demand that they leave Asia to the Asiatics.

This article, said to be written by a diplomat well versed in Oriental affairs is worth attention only because we see here the working of a force that effectively counteracts any anti-Japanese propaganda that might try to connect Japan with Chang Tso-lin. It is not Wu that America is backing but Chang and the Japanese are not behind Chang, but Wu. The German diplomat is seemingly living up to that national reputation for perspicuity in international politics which won for them the world war.

Soviet propaganda is being concentrated upon devilling America until it is accorded recognition, harping on the warning that unless this comes soon, it will drive Russia into the arms of China and Japan for the creation of a league that will mobilize Asia against our interests. In the meantime it is having one beneficial effect. As long as the Soviet can put over their dope, it will be extremely difficult for the professional anti-Japanese agitator to attract public attention to his tales of woe about the doings of the Japanese.

Anticipating the Inevitable

While posing as the champion of China against the "capitalistic western powers," the Soviet is living up to its reputation for slippery diplomacy by entering into a separate treaty with Chang Tso-lin, the over-lord of Manchuria, which in its practical application has been equivalent to a *coup d'etat*. Moscow's recognition of an independent Manchurian government after establishing diplomatic relations with the sovereign power at Peking is an added proof of its perfidy in dealing with Asiatic peoples, in line with its fixed program to unsettle the affairs of neighboring states as a preliminary to their absorption into the union of Soviet republics. Mongolia is already lost to China. Sinkiang has signed an independent trade treaty with Moscow and now Manchuria is started along a road that will ultimately bring her under the same influence. A Soviet delegate is attached to the government of Sun Yat-sen at Canton, so the conclusion of the Manchurian agreement gives Moscow five diplomatic representatives accredited to the various so-called independent governments in different parts of China. While such inconsistencies are highly characteristic of Moscow's diplomacy, yet open-minded observers must admit that the Soviet is simply taking the lead in arriving at a solution of China's problem along lines endorsed by competent American and British observers as the only practical way out of the present morass of militarism.

Dr. Schurman, the American minister to Peking, has declared himself in favor of a federal government in China supported by the independent or self-governing provinces, while Sir John Jordan, the foremost British authority on Chinese affairs, has also expressed the opinion that a "United States of China" is the only practical way to reunite the provinces under one central authority. Both of these solutions are obviously based on a recognition of provincial independence, an acceptance of the accomplished fact, which the powers for reasons of their own have ignored in order to uphold the supremacy of Peking for the sole purpose of preserving continuity of diplomatic relations and responsibility for acts which Peking is powerless to control. The picture presented by the concert at Peking is the most roaring diplomatic farce that has ever been enacted on the international political stage and it is no wonder that the astute Soviet leaders have taken advantage of the situation to advance their own ends under cover of a principle which has received the approval of the best American and British experts.

If the only practical way to reunite China is through the establishment of a federal government at Peking, this carries with it acknowledgement of the principle that the provinces are and have the right to be independent. This being so, Moscow has simply blazed the trail over which the other nations must follow. Jealousies between the powers and the fear that one may obtain some advantage over the other by independent action is playing into the hands of Moscow. Sooner or later we will wake up to find a situation precipitated that will compel the abandonment of neutrality in the affairs of China unless the powers come together and formulate some forcible program that will stabilize conditions in this country. Otherwise, the future control of China will drift into the hands of the little group in Moscow whose avowed purpose is to use the Chinese people in their fight to bolshevise the world.

The Soviet-Manchurian Agreement

In the Manchurian agreement the Soviet has flouted Peking, contemptuously ignored the French interests in the Russo-Asiatic Bank which financed the construction of the Chinese Eastern Railway and in so many words has told Japan and the United States where to go to with their financial claims on the railway. The agreement consists of seven articles, two of which, the longest and most important, provide for the administration of the Chinese Eastern Railway by a joint Sino-Russian board of directors with its operation controlled by Russians. Chinese public opinion is pandered to by a clause reducing the time-limit for the reversion of the railway to China from eighty to sixty years with a proviso that even this limit may still further be reduced by mutual consent. A further sop to Chinese sentiment is contained in the equally empty clause providing that from the date of signing the agreement China shall have the right to redeem the line at a fair price.

The reduction of the time-limit carries the same significance as the original twenty-five year term to the Liaotung lease at a time when Great Britain, Germany and France were exacting ninety-nine year leases for Kowloon, Kiaochow and Kwangchow-wan. Russia never had the slightest intention of living up to the terms of this lease, proceeding immediately to convert Manchuria into a closed preserve in which foreigners would not be allowed to reside or travel. Her defeat at the hands of Japan was the only argument that could have moved her to evacuate Port Arthur and Dalny. So the reduction of the time-limit for the reversion of the C.E.R. to China is only another dodge to impress the credulous Chinese and embarrass the Japanese in their position in South Manchuria. There is no more prospect of China redeeming the C.E.R. by purchase within the next twenty-five years than there is for her to redeem the S.M.R.

The only effect of this agreement will be to complicate further the already highly complex Far Eastern political situation by bringing Russia once more into Manchuria and making Japan's position still more difficult. The agreement has accomplished its purpose. The Soviet has moved into Harbin and taken over control of the Chinese Eastern Railway. The treaty has outraged international conventions but it will stand. As soon as a federal or some other form of central government is once more exercising authority, the Peking agreement with the Soviet will automatically extend to Manchuria and supersede the agreement with Chang Tso-lin. It would seem that the Soviet has simply anticipated the inevitable, taking advantage of the dissensions of the powers to re-enter into possession of the old Russian rights in the C.E.R.

Japan at the Cross-Roads

Who will interfere? France can do little to defend the interests of the Russo-Asiatic Bank as long as Chinese and Russians contend that the sale or transfer of C.E.R. bonds to citizens of countries other than China or Russia is illegal. The United States will hardly go further than a diplomatic protest in order to protect the American financial interest in the C.E.R. created by advancing \$5,000,000 when the line was under international control. Japan alone might take decided steps if her vital interests in South Manchuria are menaced. Japan has no desire to fight anyone at this time as long as her rights in South Manchuria are respected. From her point of view America, Great Britain and France are equally interested in preserving China's integrity in Mongolia and Manchuria, a doctrine they forced down Japan's throat with the consortium agreement, so unless they are willing to support their policies by force, it is foolish to believe that Japan will invite hostilities single-handed with the Soviet, when she can avoid such a catastrophe by an amicable understanding.

From whatever angle we approach it, the new aspect given to Manchurian affairs is far from reassuring. The re-entry of Russia into North Manchuria and control over the C.E.R. must be accepted as a brilliant Soviet victory which may force Japan against her present inclination to join the new Russo-Chinese-Asiatic bloc as the only alternative to another disastrous war for which she has no heart and is ill-prepared to meet. On the other hand, Russia may rest content for a time with her recent gains and not complicate matters further by raising issues that may vitally affect Japan's position and rights. Japan also may be quite ready to renew her old understandings with Russia in regard to the maintenance of mutual rights in Manchuria and Mongolia, rather than invite a situation that would call for constant military preparedness to meet the possibility of a clash that Japan would have to face alone—thanks to the American diplomatic victory at the Washington conference which preserved peace in the Pacific but deprived Japan of her one insurance against war in Asia.

The present government of Japan is animated by a sincere desire to shape the destinies of the empire along lines that will bring about closer relations with the United States and the liberal peoples of the west but there is an influential element in that country which advocates a closer understanding with Russia. A sudden cabinet crisis may bring this element into power and align Japan once more with Russia, a possibility that has been brought immeasurably nearer by the attitude of the American government in the recent immigration imbroglio.

New Taikoo Launching

THE largest boat ever built to the order of the China Navigation Company was launched at the Taikoo Dockyard on October 4, when Miss Gladys Grace performed the naming ceremony of the *s. Anhui*. This vessel, which is of the awning deck type, has an overall length of 350-ft., a beam of 49-ft. and 34-ft. depth to awning deck, built to scantlings approved by the British corporation on the deep framed system, with a cellular double bottom all fore and aft, three complete decks, and four cargo holds. A large steel deckhouse amidships has accommodation for 20 first-class passengers with saloon at fore end. On the promenade deck are state-rooms and saloon for eight saloon passengers. The dining saloon has been designed and panelled in dark hardwood. The officers and engineers are accommodated in rooms abaft the passengers' state-rooms. On the boat deck in a steel house are the captain's room with chart room forward. At the after end of boat deck is a steel house for the wireless operator and a room for the officers' recreation, combining smoke room and music room for their use. The vessel has ten steam winches and ten derricks arranged for 2, 5 and 10-ton lifts, while provision has been made for a 30-ton derrick. Electric light is fitted throughout the vessel and a plentiful supply of fans. Eight lifeboats are housed on boat deck, the davits being fitted with Turnbull's patent turning out gear. The machinery consists of one set of geared turbines of the Brown Curtis type, supplied with superheated steam from three multitubular marine boilers having a working pressure of 220-lb. per square inch. Turbines and boilers have been constructed by the Taikoo Dockyard. A speed of over 13 knots is anticipated.

Immediate Filipino Independence

Repeal the Exclusion Act

"The Filipino people have succeeded in maintaining a stable government and have thus fulfilled the only condition laid down by congress as a prerequisite to the granting of independence. We declare that it is now our liberty and our duty to keep our promise to these people by granting them immediately the independence they so honorably covet."

THIS flat statement of policy in the platform of the democratic party admits of no misinterpretation. It means exactly what it says and if Mr. Davis is elected president of the United States he will be called upon to live up to his party's pledges and give immediate satisfaction to a people who notwithstanding their many shortcomings have the courage to want to paddle their own canoe. The Filipino viewpoint is sound. They scout as absurd the republican party's idea that independence should be conceded twenty-five years hence, declaring that they have already passed through twenty-five years of training under American direction and have now arrived at maturity with a full capacity for self-development. It is nothing short of silly they say for men in power to-day to commit themselves as to what is to happen twenty years from now. Not only will they be out of power but out of this world and another twenty years of imposed government is apt to have a disastrous effect on men yearning for freedom and facing the possibility that new arguments will be advanced to maintain them in further bondage.

If these views have been accepted by the democratic party and incorporated in its platform in language that admits of no misunderstanding, Americans in the Far East must be prepared for withdrawal from the islands as soon as the democratic party comes into power. It may be next year, it may be four or even eight years hence, a few years more or less does not matter, but the pledge will stand and will be kept. Each year the clamor for independence will become louder and carry with it a growing unrest amongst a people who are liable to translate their discontent into action.

There will be considerable difference of opinion as to the wisdom of carrying out the national pledges reaffirmed in the democratic platform due to the bearing Filipino independence has on our present conception of strategic needs in the Pacific and its relation to international politics. To date, the issue has been remarkably free from any suggestion that an independent Philippine republic might be endangered through Japanese aggression. Fortunately, that bugbear cannot be conjured up as an argument against complying with our pledges to the Filipino people while Japan is a party to the four-power agreement. The Filipinos do not fear Japan. Mr. Quezon, leader of their fight for independence and probable first president of the new republic, says flatly, "Japan does not want the Philippines." The Japanese, he adds, "cannot live there. Some 15,000 Japanese laborers were introduced in the hemp fields some years ago and they died like flies. If Japan were aggressive, continued Mr. Quezon, she had every chance in the world to annex the Philippine Islands during the three centuries of Spanish rule. Japan demonstrated that she was a peace-loving country when she returned Shantung to China."

Quezon talks sense. The Filipino leaders have undoubtedly held many conferences with representative Japanese and received assurances in which they place implicit confidence. If the Filipinos are satisfied, it is no one else's business. Unless the United States is in the Orient on imperialism bent, neither can the argument that we require a permanent naval base in the Philippines be advanced as a reason why we should violate our promises to the Filipinos. Quezon sounds an appealing note when in answer to this argument, he remarked that it was time for the world to talk of permanent peace bases, and this sentiment we are sure, will find

an echo in the hearts of the American women whose votes will largely decide the coming election.

Although we incline to the belief that the Filipinos are not yet on an economic basis that will enable them to stand alone, this again is their own affair. The one thing that concerns Americans is the condition attached to our promises—their *ability to govern themselves*. This will always be a debatable question and decided, not on its merits but along strictly party political lines, with the republicans insisting that the democrats made a mess of things when they were in power and the latter equally insistent that they faithfully carried out their pledges to the nation and that the islands were brought to a high state of self-government where independence was in sight until their work came under the scrutiny of the Woods-Forbes mission. So there is little profit in taking sides in a debate which has degenerated into an acrimonious mud-slinging political wrangle. The Filipinos point with pride to what they accomplished when they had a chance and bring forward facts and figures to prove that they are now fully able to manage their own affairs. They may be too optimistic but as long as they insist on their viewpoint and can get their story printed in the American press, there will always be a majority of the American people who will sympathize with them. The Philippine plank of the democratic platform will appeal to Americans as being in line with the principles underlying their own national life and if the election could be decided on this point alone, there is little doubt of what the verdict would be.

Such a verdict would reflect in no manner on the labors of the officials appointed under various republican administrations to direct the affairs of the islands nor could it dim in the slightest the splendid record of Governor-General Leonard Wood. It would mean, if anything at all, that the American people are living up to their traditions and refuse to hold a people in political bondage because of sordid commercial or untenable strategic and political reasons. The Filipino problem simmers down to a moral issue, in which dollars and cents and battleships and bayonets has no place. We must either live up to our pledges and concede independence to the islands or invite suspicion that we are as much to be feared as any other imperialistic power. And our policies in those countries whose shores are laved by the Caribbean will give strength to this sentiment.

There are angles to Philippine independence bearing on purely Far Eastern affairs which seem to be imperfectly understood at home. Americans residing in the islands, all advocates of postponing during their lifetime the fulfillment of our pledges, point with pardonable pride to the trade returns as a reason for hanging on, but the fallacy of their arguments would seem to be fully proven by the figures given elsewhere in this number of THE FAR EASTERN REVIEW in a discussion of the labor situation arising from an expert investigation of the sugar industry. The gain to the national economy from our exports to the Philippines is offset four times by the amount of indirect subsidy conceded in tariff reduction on Philippine sugar and tobacco. It is true, perhaps, that the trade between America and the islands is capable of great expansion. This also is true of our trade with many other sections of the world, notably with China and Japan.

If there was any possibility of the United States ever reaping a reasonable profit from its investment in the islands, we would

change our views in this matter but to date all evidence seems to point to the fact that our exports to the Philippines will expand only in proportion as their resources are developed and the purchasing power of the people increased. The only large scale development in sight is a further increase in sugar production, an industry so dependent on the remission of our import duties that it could not last a day after this tariff concession is withdrawn. It would die a natural death if even the industry was placed on a plane of tariff equality with the Cuban product. The prospective increase of the insular sugar industry in a few years to an output of one million tons simply means an increase of the tariff subsidy to \$40,000,000, much more than the present entire revenues of the islands. Granted an abnormal profit of ten per cent., this would represent \$400,000,000 of American exports, or eight times our present sales. We doubt very much if the purchasing power of the Filipino will keep pace with such an increase of the subsidy, and the result will be as pointed out in another article, the maintenance of the Philippine farm laborer in an idealistic soviet paradise.

Outside of sugar, there is no probable expansion of insular resources that holds out the promise of adequate returns on the capital investment so long as the present land and labor laws remain in force. The government owns some 73,000,000 acres of the public domain all available for agriculture and industrial development, yet at the expiration of twenty-five years of American rule, only 7,300,000 acres or one-tenth the public lands have been brought under cultivation. The American government hesitates to throw these lands open for fear that rapacious foreign syndicates will deprive the Filipinos of their patrimony, nor does it seem to have the moral courage to revoke the immigration laws without which the resources of the island can never be developed. Both of these basic economic issues are being characteristically side-stepped, the last under the provisions of a measure that will circumvent the immigration law by admitting foreign contract labor under restrictions and limited terms of employment. In other words, a revival of the obnoxious coolie trade which has recently been brought under the searchlight by a commission appointed by the Chinese government and condemned in the strongest language. Such a palpable evasion of the exclusion laws will fail to accomplish its purpose. It is a foregone conclusion that any Chinese government retaining a modicum of self-respect, will oppose any further extension of the coolie trade, no matter how well it may be regulated. The only straightforward and honorable way to meet this question is to annul the application of the American exclusion laws to the islands. This will have to come in time anyway, as a

pre-requisite to recognition of an independent Filipino republic by its Asiatic neighbors.

If this is inevitable, then why wait for Filipino independence to terminate a situation that only strengthens Asiatic resentment against the American people? Immediate repeal of our exclusion laws as applied the Philippines would convince the Japanese of our real friendliness and take the curse from our recent uncalled for action at home by opening an outlet for their capital and energies in Asia. If the Filipino people do not fear aggression on the part of Japan or object to the competition of the Chinese, and the admission of these people and their capital into the islands will stimulate their rapid industrial development and the creation of an economic foundation to their future political structure, then why in the name of common-sense and practical politics should America persevere in her stiff-necked attitude on this question.

Here we stand, faced with the possibility of immediate withdrawal from the islands if the democratic party emerges victorious in the coming elections, leaving our wards to build their own economic foundation to the top-heavy political edifice that we have been a quarter of a century in perfecting and which must crumble into a dust heap the minute independence becomes a fact and the islands bereft of the benefits of our tariff concessions. For it is folly to presume that independence will carry with it special tariff concessions that will further embarrass the American taxpayer with the maintenance of a government which has been in such a hurry to escape from under our rule. Independence if it comes, should be absolute, without strings, and the Filipinos should be permitted to solve their own problems in their own way. If it must come, then it will be more charitable and philanthropic on our part to anticipate the event by the immediate rectification of a mistake that will at least permit our wards to prepare for their own economic welfare.

An independent Filipino republic will gradually drift further and further away from American influences and its destinies become interwoven with those of its immediate neighbors. More and more the political stability and economic prosperity of the Filipinos will be determined by their relations with other Asiatic peoples. If we are honest with ourselves and with our wards we can lay the foundation of a lasting good-will on the part of China and Japan towards the infant republic, by anticipating the inevitable and removing a barrier that now stands as a challenge and an insult to those on whose friendship rests to such a large extent the permanent success of our experiment in colonial government.

Labor's Utopia in the Philippines

Remarkable Success of Lenin's Principles as the Outgrowth of America's Philanthropy

A New Angle to the Philippine Problem

AN American guardianship over an unwilling, ungrateful and generally cantankerous ward when stripped of all its glamor reveals the plain truth that our continued control over the Philippines is simply a matter of national politics, a conflict between commercial imperialism on one side and a more rigid adherence to national ideals on the other. Our office holders, army and navy officials, big-business men, philanthropists and educators advance each in their own way and from the viewpoint of their own interests their specious reasons in support of a system wholly repugnant to the basic ideals of our national life, while the democratic party at every possible opportunity flatly advocates a return

to our traditional outlook on the fundamental rights of a people to govern themselves, by immediate withdrawal from the Philippine Islands. The democratic party has lived up to its professed principles and under Wilson had nearly severed the tie that binds the islands to the United States. Once again, the democratic leaders declare their determination to get out of the islands by inserting this program in their party platform for the election of a new president.

The Philippine question has descended by rapid stages from a lofty conception of carrying the white man's burden to a partisan political squabble, with the "burden" kicking, biting, and insulting its carrier in its efforts to be unloaded and left where it is dropped.

It is not our purpose to review the Philippine question in its many ramifications but to invite attention to an entirely new viewpoint disclosed by the perusal of a recent expert report on the insular sugar industry. It has been generally admitted that the greatest obstacle to capital investment in the island is the state of political unrest due to the independence movement kept alive by native politicians. On the other hand, we are informed that the people as a whole are happy, prosperous and contented with American rule. If the report which follows is true, they ought to be.

THE FAR EASTERN REVIEW has consistently maintained a purely independent and critical attitude towards our Philippine problem and has invariably rejected the cant employed to justify our continued presence in the islands. We have held and will continue to hold that the main obstacle to the development of the resources of the islands is fundamental—the *Malay don't like work*. This is the key to the problem, yet instead of devising methods that might compel him to exert himself, Americans have done everything to encourage him in a state of semi-idleness. One of our first steps was to revoke the old Spanish law which compelled the farm laborer to work out the cash advances made by the planter in order to get him on the job; we then extended our exclusion laws to the islands which kept out competition in the insular labor market and then indirectly, of course, we voted a huge subsidy from the national treasury which enabled him to exist in comparative idleness by contributing one hour's work in a twelve-hour day to the development of the principal insular industry. Analyzed in an unbiassed manner, our much vaunted experiment in the Philippines, the acme of altruistic disinterestedness in the government of a backward people, comes about as near to being an ideal application of Soviet principles as anything ever dreamed of by Lenin in the hey-day of his power.

We have before us the expert report of Mr. Arnold H. Warren on the Philippine sugar industry who prefaces his array of facts with the query—"is the Philippine sugar producer building his house upon sand?" After a careful analysis of his facts which conclusively prove that the industry is dependent for its survival upon the American tariff, the answer to his question, is an emphatic—YES! Some months ago we commented on this same situation pointing out that that the real prosperity of the islands was based on its sugar industry and this in turn constituted a free gift from the American people through the remission of duties that well might go to swell the treasury receipts and help pay our war debts.

Considerable emphasis is laid on the fact that our trade with the islands has increased 700 per cent. in the last twenty years yet a further analysis of these figures proves conclusively that the profits arising from this trade are offset more than four times by our annual remission of duties on one item of insular produce alone. For instance, the trade of the Philippines for 1923 totalled \$202,552,737, of which 65 per cent. was with the United States. In that year, the islands purchased \$50,654,710 worth of American goods, which is all that we can rightly expect to make a profit on. A large part of this trade was in machinery and other supplies for the sugar industry. If we allow a liberal profit of ten per cent. on this trade, we have about \$5,000,000 which went to swell our national economy, while on the other hand the American government remitted from its treasury about \$20,000,000 of the taxpayer's money on sugar alone in order to make this profit possible. If this is not philanthropy, we don't know what is. Deprived of this magnificent subsidy, the Philippine sugar industry would cease to exist. Even a material reduction in this preferential tariff to equalize the position of the Cuban planter, who has a much better claim to our generosity, would spell ruin to the Philippine industry.

Our contention that even with this free gift from the treasury, the Philippine sugar producer is barely able to cover the costs of planting and milling is supported by a comparison of manufacturing costs in other sugar-producing countries which show that the Philippines cost is 4.278 gold cents per pound against 2.274 in Cuba. The Cuban producer pays in addition 1.76 gold cents per pound duty, a very important contribution to our national revenues, which, added to his manufacturing costs, permits him to land his product in the United States at 4.034 gold cents a pound, or one-quarter of a cent under the manufacturing costs of the Philippine planter. Our duty to the Cubans is almost the same as our obligation to the Filipino, and when it is considered that most of the capital invested in the Cuban industry is American, there is even a greater reason why charity should begin at home.

In seeking for a reason that will explain in part the abnormally high costs of production in the Philippines, we reluctantly come back to our old contention that the Malay won't work unless compelled to either by law or the urge to exist. Of course, this is a sweeping generality, qualified by many local conditions throughout Malaya, but our experience is that the statement holds good in any fair criticism of the Malayan peoples.

This statement is fully supported by the expert testimony of Mr. Hind in which he shows that the Java Malay who must work or starve does six times the amount of work performed by his Filipino cousin at one-half the wages, which reduces the field cost of labor in Java to about one-twelfth of the cost in the Philippines. It would seem from Mr. Warren's survey that if the costs of sugar production in the Philippines are to be materially reduced it can only come from increased yields (calling for irrigation and fertilizing) and greater labor efficiency. The only item which seems incapable of bringing to a higher state of efficiency is that of labor and we are satisfied after twenty-five years of close observation that this is practically impossible under present or future conditions in the islands. What is needed to make the Filipino field laborer efficient is the competition of the Chinese, but here our conception of duty to our wards forbids this. The entrance of Chinese and Japanese capital and labor into the islands would convert them in ten years into another earthly paradise contributing their stores of much needed tropical products to the markets of the world at prices that would materially reduce the mounting costs of existence.

Yet in order to intensify racial hatreds and hold the islands intact for their original inhabitants we extend to them our exclusion laws, teaching one Asiatic that he is better than another by barring out the very people who could develop their resources. The figures show that the United States is paying out of its treasury about \$20,000,000 gold annually to maintain a basic industry in a dependency whose people according to the most expert investigators do six times less work at twice the wages than the same people do in the adjacent possessions ruled over by the Dutch. We have enacted laws which prohibit corporations from owning large tracts of land in the Philippines and justify this measure by declaring it was done to prevent greedy capitalists from grabbing the lands of the natives during our tenure of guardianship over their affairs. This is pure bunk and piffle. The beet sugar lobbyists in Washington will tell a different story. They, combined with the refiners and the Louisiana planters, forced the passage of this law to prevent American capital from developing a huge sugar industry in the islands that might in time menace their own favored position under our high protective tariff system. The only concession they would make to the islands was to permit the entrance of a limited amount of duty free sugar, originally placed at 250,000 tons. The labor unions then influenced congress to extend the Asiatic exclusion laws to the islands because in their opinion it would be almost impossible to prevent a Chinese resident of a dependency from free entrance into the metropolis. In order to preserve these fictions and establish our record as a high-minded colonizing power, we go further and remit the sugar duties, now amounting to about \$20,000,000 a year, which Mr. Hind demonstrates in convincing words and figures, goes in large part to maintain a people whose favorite diversion is to frequent cock-fights and gamble away their earnings until sheer necessity forces them to seek manual labor long enough to provide the funds to keep them in another period of arcadian idleness.

Labor constitutes the largest item in the manufacturing costs of sugar, so if the Java product costs 2.73 gold cents a pound to produce against 4.27 cents in the Philippines, it can only be explained by the fact that the Java planter receives twelve times more work out of the identical type of field labor than his Filipino competitor. In other words, owing to American altruism and a determination to continue in business as an eleemosynary institution, we take from the pockets of the American people a yearly subsidy of \$20,000,000 gold and hand it over to the Filipino planter and sugar manufacturer in order to maintain hundreds of thousands of native farm laborers who give one hour of work a day as against twelve hours on the part of their racial kinsmen in Java. And we go still further. We protect the Filipino farm laborer against all possible competition that might compel him to render an honest day's work in return for the highest daily wage paid in the Orient, by the application of exclusion laws which preserves his monopoly of the insular labor market.

This situation comes about as near to the principles underlying the Russian Soviet system as anything we know of. If Lenin could have taxed the rich or exacted an excessive export duty on some particular Russian product and handed over the proceeds to the peasants by paying them a full day's wage for less than one hour's work and then put up the bars against the entrance of other people into this worker's Utopia, the success of his system would have been assured. If our guardianship over the Filipino is to result

in the extension of this system by increasing the sugar output of the islands to one million tons, entailing an annual present of \$40,000,000 gold to the insular sugar industry, it is high time that we give the whole Philippine problem another once over and seriously consider the plank in the democratic platform which provides for an immediate getting from under a load which is diverting millions from the pockets of American laborers in order that their Malay brother may dwell in a Soviet paradise.

Is The Philippine Sugar Producer Building His House Upon Sand?*

By Arnold H. Warren, Accountant and Sugar Chemist

THE Philippine sugar industry is entering a period of rapid expansion. It has just emerged from a period of radical change in the processes of sugar manufacture. In 1918 over 80 per cent. of the Philippine sugar crop was muscovado; in 1922 over 80 per cent. was centrifugals. Nowhere in the world has a change from antiquated to modern methods of manufacture been effected so quickly. The change from muscovado to centrifugal mill is now nearly complete, but the Philippine sugar industry is now entering upon a new period of transition which promises to be of greater significance to the future welfare of the country than was even the change from antiquated to modern methods of manufacture. I refer to the present rapid expansion in the area devoted to cane culture and in the total volume of the sugar crop. During the thirty years ending with 1922 the total output of Philippine sugar had remained practicably stationary. The total volume of the Philippine sugar crop is now, however, increasing by such leaps and bounds that it has been predicted that within five years the total sugar production of these islands will exceed 1,000,000 tons. The following figures are significant:—

| Total Sugar Produced in the Philippines | | | | | | |
|---|-----------|-------------|-------------|-------------|-----------|-------------|
| Crop | Muscovado | | Centrifugal | | Total | |
| | Piculs | Metric Tons | Piculs | Metric Tons | Piculs | Metric Tons |
| 1922-23 ... | 710,862 | 44,962 | 3,577,775 | 226,298 | 4,288,637 | 271,260 |
| 1923-24* ... | 700,000 | 44,275 | 4,968,566 | 314,266 | 5,668,566 | 358,541 |
| 1924-25 ... | 700,000 | 44,275 | 6,666,210 | 421,644 | 6,366,210 | 465,919 |

*Muscovado Production for 1923-24 estimated, as final figures on muscovado production are not yet available.

Causes of Present Expansion

One cause of the present rapid increase in the sugar output of the Philippines is the relatively high price which Philippine sugar is able to command as a result of free entry into the American market under a high protective tariff. The operation of this cause is self-evident and requires no comment.

The mere urge of a favorable price alone would not, however, have been sufficient to induce the present rapid expansion of the Philippine sugar industry. There is a second and more imperative cause. The rapid change from muscovado to centrifugal mills was effected during the period of war inflation. As a result the cost of erecting the new modern factories was abnormally high. With the sudden deflation of sugar prices which occurred in 1921 many of the new factories found that the only possible method of securing a profitable return upon the capital already invested was to increase the initial capacity of the factory and at the same time to so increase the production of cane as to permit the factory to grind up to the limit of its new capacity.

Many of the planters also had accumulated a load of indebtedness on their haciendas so great that they could not pay the interest a charge let alone amortize the principal without very greatly increasing the yearly output of sugar cane from their haciendas.

Two means of increasing Philippine sugar production were available and both are utilized. One means was to increase the area planted to cane. The other was to increase the quantity of sugar produced per unit area.

In order to permit the planting of new areas to cane additional crop loans have been extended to the planters. The Philippine National bank has played a large, albeit somewhat unwilling, part in the extension of these crop loans. With around forty million pesos of its funds tied up in six centrals built during the period of war inflation, the bank, finding itself unable to withdraw from the sugar industry, has seized the other horn of the dilemma and now, by advancing additional capital for enlarging the initial capacity of the centrals and for extending the area planted to cane, hopes eventually to recover most, if not all, of the enormous sum which it now has tied up in the industry.

As a quick means of increasing the yield of sugar per hectare commercial fertilizer has been successfully introduced. During the past two years extensive field experiments have been conducted throughout the sugar-producing districts to determine the kind and quantity of fertilizer which would yield the maximum return on the money expended for fertilizer. As a result of these experiments the present fertilizer requirement of Philippine cane is now fairly well understood. The quantity of commercial fertilizer used in growing the 1923-24 crop of Philippine sugar cane probably exceeded 10,000 tons, and a considerably greater quantity is being applied to the 1924-25 crop.

Partly as a result of the use of fertilizer and partly as a result of favorable weather conditions, and more efficient methods of cane culture and modern methods of sugar manufacture, the average yield of sugar per hectare was close to 65 piculs for the 1923-24 crop as compared with an average yield of 34 piculs of sugar per hectare reported by the bureau of agriculture in 1918. The average of sugar per hectare of the Philippines is still less, however, than the yield of any other sugar-producing country.

Rank of Sugar Among Major Industries

Sugar has already for some years been the largest single item of export from the Philippines. And if the increase in sugar production continues at its present rate the value of the sugar exported will in less than ten years exceed the combined value of all other exports. The bureau of customs reports the principal exports from the Philippines for the calendar year 1923 as follows:

| Article | Per cent. of Total Exports | Value |
|-------------------------|----------------------------|---------------|
| Sugar | 29 | P.69,038,246 |
| Hemp | 21 | 49,903,150 |
| Copra | 16 | 38,493,998 |
| Coconut oil | 10 | 28,133,164 |
| Tobacco products .. | 8 | 21,034,893 |
| Total of all exports .. | 100 | P.241,505,980 |

The bureau of agriculture reported the total value of, and area devoted to the nine principal agricultural crops of the Philippines to be as follows on June 20, 1923:

| Crop | Hectares Under Cultivation | Value |
|--------------------------------|----------------------------|---------------|
| Rice | 1,675,870 | P.149,475,950 |
| Sugar Cane | 227,290 | 87,831,550 |
| Coconuts | 456,440 | 64,366,220 |
| Hemp | 513,420 | 39,317,490 |
| Corn | 557,690 | 32,388,700 |
| Tobacco.. .. | 64,730 | 6,814,800 |
| Totals for 9 principal crops.. | 3,526,205 | P.385,143,280 |

Capital Employed in Philippine Sugar

Exact statistics as to the total amount of capital employed in the Philippine sugar industry are not available. The following estimate prepared by the writer is drawn from various sources of information:—

| | |
|--|---------------|
| Capital employed by sugar factories | P.130,000,000 |
| Capital value of land, including farm buildings, equipment, and livestock employed in cane culture (227,000 hectares at P.700 per hectare) | 158,900,000 |
| Capital invested in the growing crop of cane (7,000,000 piculs at P.3 per picul) | 21,000,000 |
| Capital employed by sugar merchants in buying and selling sugar in the Philippines (excluding that included in previous items) | 10,000,000 |
| Estimated total capital employed in Philippine sugar industry | P.319,900,000 |

The above estimate covers only the capital directly employed in the production and marketing of sugar. There is, of course, a large additional body of capital employed: by merchants selling supplies and equipment to those engaged in the sugar industry, by machine shops and foundries devoted to the manufacture and repair of sugar mill machinery, by railroads and interisland vessels engaged in the movement of sugar, and of supplies, and of equipment required by the sugar industry. It is impossible at present even to estimate the aggregate amount of this large additional body of capital which is dependent for a profitable return upon the continuance and prosperity of the Philippine sugar industry.

Cost of Producing Philippine Sugar

It is only within the last year or two that accurate data as to the average cost of producing sugar in the Philippines has been available. In any consideration of the Philippine production costs it is essential to remember that in the Philippines production of sugar is a partnership undertaking in which two parties—the planter and the sugar factory—are jointly engaged. Furthermore although it is a joint undertaking the two parties do not share and share alike in either the cost of production or in the division of the product. Neither party, however, can succeed without the other. If the planter cannot produce cane at a profit the central will not be supplied with cane for the manufacture of sugar. And if the central cannot manufacture sugar at a profit the planter will have no means of converting his cane into a marketable product.

Any intelligent analysis of Philippine production costs must therefore include a consideration of the cost both to the central and to the planter; and obviously it is cost to the party which works upon the narrowest margin, which is the determining factor in the success or failure of the industry. The cost of sugar production to the Philippine planter.

Under present conditions it is the planter who works upon the narrowest margin. It is the cost of production to the planter, therefore which must be given the most serious consideration.

Probably no one is better qualified to speak upon the subject of the cost of production to the Philippine planter than Carlos Locsin. Mr. Locsin is both a sugar chemist of repute and a successful planter. Mr. Locsin has recently published (Sugar News for September 1924) what is probably the most authoritative statement of the cost of sugar production to the Philippine planter.

Mr. Locsin finds the cost of production to the planter to vary according to the yield per hectare. He gives the cost for yields varying from 50 to 120 piculs of sugar per hectare. Furthermore, since the centrals and the land owner each secures a fixed percentage (45 per cent. to the central and 12 per cent. to the landowner) of the total sugar produced, the manufacturing cost to the planter on his share (43 per cent.) of the sugar varies according to the selling price of the sugar. Mr. Locsin's calculations assume a selling price of P.12 per picul ex centrals warehouse.

Mr. Locsin's method of calculation assumes that the planter in effect buys the central's and the landowners' shares of the sugar at the selling price of the sugar, and then sells all of the sugar produced at the same price as he paid.

COST IN PESOS PER PICUL OF THE PLANTERS SHARE OF THE SUGAR PLACED IN THE WAREHOUSE AT THE CENTRAL WHEN THE SELLING PRICE OF THE SUGAR IS P.12 PER PICUL.

| (Calculated by Carlos Locsin) | | Total Yield of Sugar in Piculs per Hectare | | | | | | | |
|---|-------|--|-------|-------|-------|-------|-------|-------|------|
| Item— | | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 |
| Paid to Central for | | P. | P. | P. | P. | P. | P. | P. | P. |
| manufacture of sugar | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 |
| Rent paid landowner, | 1.44 | 1.44 | 1.44 | 1.44 | 1.44 | 1.44 | 1.44 | 1.44 | 1.44 |
| Planting, cultivation, etc. ... | 3.00 | 2.50 | 2.14 | 1.88 | 1.67 | 1.50 | 1.36 | 1.25 | |
| Cost of fertilizer ... | ... | ... | ... | .81 | .72 | .65 | .59 | .54 | |
| harvesting expense | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 | .80 |
| Depreciation of buildings, implements and livestock ... | 1.00 | .83 | .71 | .63 | .56 | .50 | .45 | .42 | |
| Totals ... | 11.54 | 10.97 | 10.49 | 10.96 | 10.59 | 10.29 | 10.04 | 9.85 | |
| Add interest on crop loan ... | .38 | .33 | .29 | .33 | .30 | .28 | .26 | .24 | |
| Total cost of production ... | 12.02 | 11.30 | 10.78 | 11.29 | 10.89 | 10.57 | 10.30 | 10.00 | |

The above method of calculating the cost of production to the planter is inconvenient in that the figure obtained for the cost is not constant for any given crop but varies with the selling price of the sugar.

It is evident that in the production of any given crop of cane the planter must have been put to a definite and fixed outlay which is entirely independent of the selling price of his sugar. It should be possible therefore to apportion this total outlay to his share of the sugar and so determine directly without reference to the selling price of the sugar the cost to him of each picul or (pound) of his share of the sugar.

Mr. Locsin's table evidently gives the various items of field cost in pesos per picul calculated on the total yield of sugar (including the central's share and the landowners' shares). The central's share is 45 per cent. of the total and landowner's share is 12 per cent. of the total. The planter's share is therefore 43 per cent. of the total. The field cost per picul of the planters share may therefore be obtained dividing the figure given in Mr. Locsin's table by 0.43 as follows:

CALCULATION OF FIELD COST PRODUCTION OF THE PLANTER'S SHARE (Yield 60 piculs per hectare)

| | Pesos per picul | Cents gold per lb. |
|--|-----------------|--------------------|
| Planting, cultivation, supervision (2.50 ÷ .43) .. | P.5.81 | 2.083 |
| Harvesting expense (.80 ÷ .43) | 1.86 | .667 |
| Depreciation of buildings, implements, and livestock (.83 ÷ .43) | 1.93 | .692 |
| Total | P.9.60 | 3.442 |
| Add interest on crop loan (.33 ÷ .43) | .77 | .276 |
| Total cost of production ex centrals' warehouse.. .. | P.10.37 | 3.718 |
| Add marketing expense | 1.46 | .560 |
| Total cost of production ex steamer New York | P.11.83 | 4.278 |

Cost of Sugar to Factory

The cost to the Philippine centrifugal factory of producing its share of the sugar is more than one cent gold per pound less than the planters cost of production. The following figures are taken from a report on the factory production costs published on page 151 of the "Compilation of First Committee Report for the First Annual Convention of the Philippine Sugar Association, October 6. 12 1923 :"

COST OF SUGAR MANUFACTURE TO THE PHILIPPINE FACTORY RECEIVING 45% OF TOTAL SUGAR MANUFACTURED 1922-23 CROPS

| | Cents gold per lb. |
|--|-----------------------|
| Transportation of cane | .32 |
| Manufacture | .33 |
| Administration and general expense | .22 |
| Total | \$0.87 |

In the issue of Facts About Sugar for July 12, 1924, is published a summary of a report showing the average cost of production for 28 Javan factories producing 12 per cent. of the total Javan sugar crop of 1923. The average cost of production for these 28 factories is reported as 2,936 cents gold per pound. No details of the various items of cost are given, and the average polarization of the sugar produced is not recorded, but it may reasonably be assumed that the average polarization of the product of these factories corresponds very closely to the average polarization of the entire Javan crop. It may also be assumed that the average cost of producing 96.5 degree sugar bears the same ratio to the average cost (2.936) of producing all the sugar as the average selling price of 96.5 degree sugar bears to the average selling price of the entire crop. Calculated in this manner the average cost of producing 96.5 degree sugar would be : $2,936 \text{ by } 0.93035 = 2.7315$ cents gold per pound.

It is realized that this figure may not be exact, but is the best figure which can be arrived at from the available data.

The cost of cane is not reported separately by all of the twenty-eight factories. But the figures reported show a variation in cost of cane between 0.87 and 1.42 cents gold per pound of sugar produced. Taking the average of these figures the approximate cost of cane in Java may be put at 1.15 cents gold per pound of sugar produced. The average cost of production in Java for the 1923 crop was then about as follows for 96.5 degree sugar :

Average cost of producing 96.5 degree sugar in Java-1923 crop in cents gold per pound.

| | |
|----------------------------------|-------|
| Cost of cane | 1.150 |
| Manufacturing cost | 1.581 |
| Total cost of production | 2.731 |

Philippine Costs Compared with Costs in Other Countries

For purposes of comparison the results of the previous calculation as to the cost of producing sugar in Cuba, Java and the Philippines are tabulated below :

COSTS OF PRODUCING SUGAR (EXPRESSED IN CENTS GOLD PER POUND)

| | Cost of Cane | Manufac- turing Cost | Market- ing Ex- pense | Total Cost |
|----------------------------|-----------------|----------------------------|-----------------------------|---------------|
| Cuban factory | 0.91 | 1.13 | .234 | 2.274 |
| Javan factory | 1.15 | 1.581 | .. | 2.731 |
| Philippine factory | 1.07 | 1.57 | .56 | 3.200 |
| Philippine planter | 2.045 | 1.673 | .56 | 4.278 |

Marketing expense is not shown separately in the case of the Javan factory. The manufacturing cost to the Philippine planter is calculated as 45 per cent. of the total cost of production to the planters (exclusive of marketing expense): Likewise the cost of cane to the Philippine factory is calculated, not from the selling price of the planters share of the sugar, but as 55 per cent. of the total direct cost of production to the central (excluding depreciation and marketing expense).

In comparing the costs given above it should be remembered that both the cost figures given for the Philippine factory and the cost figures given for the Philippine planter are probably somewhat below the average cost of sugar production in the Philippines to-day.

The figures given for the Philippine factory represent the cost of production in one factory only, and that one of the largest and best managed. There are many small factories in the Philippines to whom the cost of production is undoubtedly higher. Furthermore these figures do not include interest on the capital invested in the central properties. Many Philippine centrals were erected at an abnormally high cost with borrowed money during the period of war inflation. These centrals are necessarily burdened with a staggering load represented by the interest and amortization of their indebtedness.

The cost figures given for the Philippine planter probably fairly represent the cost of production for the most successful planters. There are certainly many planters, however, for whom the cost of production is much higher.

The chief causes of the present high field cost of producing sugar in the Philippines may be itemized as follows :

1. *Extremely low yields of sugar per hectare.*—The average yield of centrifugal sugar per hectare for the 1922-23 crop was only 57 piculs. The average yield for the 1923-24 crop, partly as a result of the use of fertilizer and partly as a result of more favorable weather conditions is probably not less than 65 piculs per hectare, although final figures are not yet available. Even this figure is, however, much lower than the yield of any other sugar-producing country. The following comparison of yields is illuminating :

Average yield of sugar for some of the principal sugar-producing countries (expressed in piculs per hectare) :

| | |
|---|--------|
| Hawaii | 197.00 |
| Java (1923) | 173.00 |
| Cuba | 88.00 |
| Philippines (1922-23) | 57.00 |
| Philippines (estimated 1923-24) | 65.00 |

Within certain limits the Philippines yield can be and is being increased. The increase of yields is of necessity, however, a slow process of evolution in agricultural methods ; and it is extremely doubtful whether Philippine yields will ever even approximate the high yields obtained in Hawaii and Java.

2. *Failure of cane to ratoon successfully in the Philippines.*—In Cuba the relatively low yield of sugar per hectare is more than offset by the extremely low cost of field operations. The extremely low cost of field operations is in its turn due to the marvelous power of Cuban soil and climate to produce ratoon crops of cane year after year with practically no expenditure for cultivation. As a rule from ten to twenty crops of cane are produced from a single planting.

It is the failure of Philippine cane to produce ratoons which is one of the principal reasons for the high field cost of productions. At present not more than one crop of ratoons, and that as a rule a very poor crop, is produced in the Philippines. This means that the land must be thoroughly plowed, harrowed and replanted at least every two years. In Cuba this operation is not repeated oftener than once in every ten years.

It remains to be seen to what extent a modification in cultural methods or a selection of new varieties of cane will improve the ratooning quality of Philippine cane.

3. *High cost and low efficiency of field labor as compared with other Oriental sugar-producing countries—Java, for example.* In Java the cane is not allowed to ratoon, but is replanted every year, government regulation concerning the rotation of crops and the production of rice requires this. But the enormous amount of field labor involved in the yearly replanting of the cane is more than offset by extremely high yields of sugar per hectare and by the extremely low cost of field labor in Java.

Java with its dense population has a huge surplus of field labor. Furthermore, because of the dense population, the Javan laborer cannot survive (as can the Philippine laborer) with little effort upon the natural products of the country. As a result the Javan laborer (according to figures given by R. Renton Hind in the September, 1922, *Sugar News*) not only receives less than half the daily wage, but does more than six times the amount of work of the Philippine field laborer. Or in other words Javanese field labor costs about one-twelfth the cost of similar field labor in the Philippines. When it is considered that field labor represents considerably more than half the field cost of producing Philippine cane, the effect of the high cost and low efficiency of Philippine field labor in boosting the cost of sugar production is obvious.

It is extremely unlikely that the present daily wage of Philippine field labor will ever be materially reduced. Certainly it cannot even approximate the low wage paid Javan labor. It is possible,

however, that the amount of work which the Philippine laborer performs in return for his daily wage may be considerably increased.

4. *Prevalence of rinderpest and other epidemic diseases which continually decimate the work animals employed in cane culture.*—The basic source of power for agricultural operations in the Philippines is the work animal—*carabao* and *vaca*. The supply of work animals is kept continually below the demand, and the cost of replacement is kept abnormally high, by the heavy annual loss of animals by epidemic disease—principally rinderpest, anthrax, and hemorrhagic septicemia. Furthermore not only is the planter's annual expenditure for work animals made abnormally high, but he is always liable suddenly to lose his animals at the time when they are most essential for his cultural operations. In times of epidemic immediate replacement of the animals lost is impossible because quarantine restrictions, if for no other reason. The disastrous effect upon the cane crop of sudden stoppage of essential cultural operations is obvious.

A serious attempt has been made during the past four or five years to substitute tractors for work animals in the production of sugar cane, but for many cultural operations the tractor has been found more expensive and less effective than the work animal. At present the use of the tractor is limited to preparation of the soil prior to planting.

Industry Dependent for Survival Upon Tariff

The candid observer is compelled to admit that with the cost of sugar production in the Philippines what it is at present the Philippine sugar industry cannot survive without the aid of an American protective tariff. Yet the present uncertain political situation makes the sudden withdrawal of such aid a serious possibility which the Philippine sugar producer is forced to consider.

The Philippine planter is making every effort to reduce and is reducing, his cost of production; irrespective of the political uncertainties of the future, any reduction in the cost of production is of immediate benefit because it correspondingly increases his profits. The process of reducing the cost of production is, however, necessarily slow, and the Philippine sugar producer can only hope that whatever change may come will not come suddenly nor too soon. Even a material reduction in the present extremely high American protective tariff would spell partial disaster to the Philippine sugar industry. It has been shown that the cost of production to the Philippine planter is at least two cents gold per pound higher than the cost of production in Cuba. The present American tariff on Cuban sugar is only 1.76 cents gold per pound. Hence Philippine sugar is already at a disadvantage in competing with Cuban sugar in the American market. The position of the Philippine producer would therefore be seriously jeopardized if the present tariff of the United States were materially reduced, to say nothing of this protection being entirely withdrawn.

Shanghai, The Future Metropolis of China

A Dream Whose Realization Depends Upon Harbor Facilities

THE development of Shanghai's harbor into an up-to-date deep water port is at the best, a depressing subject. What is now the first port of China, the distributing point for the vast Yangtze region, would probably have remained in the same category as Tientsin, Foochow, Antung or any of the other third rate coast ports if the Chinese had been permitted to have their own way. The development of the port of Shanghai to its present proud position was made possible solely by stipulating that its improvement be undertaken as one of the penalties imposed upon China for the Boxer outbreak of 1900. The protocol of this memorable document has been shot so full of holes that the major principles underlying it have been lost sight of in an epidemic of philanthropic insanity on the part of the powers to remit the cash penalties imposed as indemnities, overlooking that the obligation to pay was the only weapon they could effectively wield to force China to live up to her other commitments under the treaty. The folly of such altruistic diplomacy is evidenced in the present condition of the port of Shanghai and the studied indifference on the part of the Peking government to any scheme that will enable the port to discharge its functions through further improvements.

The Boxer protocol provided for the creation of what is now known as the Whangpoo conservancy board, a technical body directed by expert foreign conservancy engineers, to whose labors are due whatever prominence Shanghai now enjoys as a deep-water port of call. The work of this commission has been confined to the improvement of the tidal river whose name it bears, nursing, coaxing and forcing the current to dig its own channel, scour its mud banks and bars and maintain a navigable depth of water. This work has been carried out with unusual efficiency but it has its limits. With the coming of larger and deeper draft vessels the position of the port became dependent upon the improvement of its Yangtze approaches and the creation of a larger port either at Woosung or some other favorable point. This fight with the forces of nature called for the most serious thought of the best experts in river conservation and in order to obtain this advice, the Whangpoo conservancy board induced the Chinese government to invite an international commission of experts to study and devise plans for the solution of the problem. It is now three years since this committee of consulting engineers composed of seven of the foremost and most experienced experts on port development and

conservancy in the world, submitted its report and recommendations. The feature of the report was its financial feasibility, whereby the whole of the work would be self-supporting without any drain on the Chinese government finances. (The full report of this commission appeared in THE FAR EASTERN REVIEW for February 1922). The report was duly forwarded to Peking, since when, nothing more has been heard about it. It has been pigeon-holed or buried in the musty archives of some bureau from where it will be resurrected a century hence for the edification of a future generation of Chinese as evidence of how their ancestors outwitted the foreigner. About the only chance the further development of the port of Shanghai may have, in our opinion, will depend solely upon concerted action of the powers, and here, mutual jealousies and bickerings, intensified since the entrance of the Soviet into the Peking diplomatic family, will effectively operate to prevent harmony.

Absorbed in its own preoccupations, the commercial community of Shanghai ignores the trend of events which is slowly but surely undermining the position of the foreigner and restoring to China her sovereign rights. Settlement extension is strenuously opposed and it is difficult to believe that the Chinese authorities will consent, except under force, to any scheme which tends to strengthen rather than diminish the hold of the foreigner on the principal port of the country. The fact that China will benefit by these improvements to a greater extent than the foreigner is an argument which carries no weight with the Chinese. We would like to believe that the scheme will be sanctioned by Peking, but the signs of the times dispel such illusions. There is only one thing that will save Shanghai from following the fate of Antwerp and sinking to the level of a fifth rate port and that is energetic and united action on the part of the powers. Under present conditions, such a solution seems a hopeless one, for the only lever that could have induced the Chinese government to act promptly on the report of the expert commission has been gratuitously surrendered in response to the continuous propaganda on the part of professional philanthropists to have the remitted Boxer indemnity set aside for the advancement of their own special interests. That this is so, the commercial community of Shanghai have only themselves to blame, for they have remained quiescent while the philanthropists and their propaganda agents have moved heaven and earth to deprive them of the only guarantee that the higher interests of the port would be given consideration.

It may be that Chinese gratitude will be stimulated by the remission of the Boxer indemnities for educational purposes; it may be that the masses of China will be uplifted and immeasurably benefited through this gesture of philanthropy on the part of the powers, but we are confident that their gratitude will never find expression in any further impairment of their administrative independence for the advancement of foreign trade. Every foreign nation looks forward to a wonderful development of its commerce with China. Especially is this true of the United States. The thought occurs to us, however, that if China has no port with the facilities for handling this increased volume of trade, and the realization of our dreams depends upon the enlargement of Shanghai's harbor, the time will arrive when pressure will have to be brought to bear on Peking to carry out the scheme recommended by the international commission, or the foreigner, in order to continue in business, will have to accept whatever conditions China is willing to concede.

The wonderful future of Shanghai painted in glowing colors by local scribes is merely a castle in the air, a mirage conjured up by publicity optimists which fades away before the cold light of every day facts. Realization of the dream metropolis on the banks of the Whangpoo must rest on the solid foundation of a port large enough to make the dream come true. And for lack of far-seeing leaders interested in this great future, the foreign commercial community of Shanghai have seen their vital interests ignored, if not sacrificed altogether in order to satisfy the propaganda created demand for education. It is high time that the important commercial interests of Shanghai awoke to a realization of where all this is leading. The federation of British industries has shown them the way and if reinforced by the recommendation of the British chambers of commerce in China it may not be too late to tie some kind of a string to the British portion of the Boxer indemnity that will work out for the benefit of Shanghai. If the Chinese government can be induced to approve the scheme for the improvement of Shanghai's harbor, the British alone can bring the required pressure to bear while they still retain control of the only persuasive argument to which the Chinese will listen.

Our local community has been regaled for the past year or so with considerable publicity about Anglo-American harmony in all matters which concern foreign interests in China. This is most commendable and praiseworthy. We make the terse comment, however, that such co-operation is confined to a very limited group of enthusiasts. The American government, it is true, may support the British in some diplomatic note urging China to consider the matter of Shanghai's harbor enlargement. The American community in Shanghai may also support such a demand, but after all is said and done, their co-operation in such a matter, now that their share of the indemnity is surrendered, will have little force compared with the more persuasive British argument. In the last analysis, the future of the port of Shanghai rests with those whose energy, initiative and capital have been largely responsible for its development into its present proud position. The British alone can make the dream come true.

* * *

"Grave Consequences"

IF Bishop Reifsnider of Tokyo is to be believed, then we have to record one more instance where the usefulness of Japanese diplomats has been destroyed by the somewhat inexplicable diplomacy of the American state department. In an address before the Tokyo rotary club on his recent return from the United States, Bishop Reifsnider declared that "the phrase 'grave consequences' in Ambassador Hanihara's note was inserted at the instance of Secretary Hughes, who, when shown a first and milder copy of the protest, requested the Japanese ambassador to 'put teeth' into the note."

"The phrase 'grave consequences' was pounced upon by Senator Lodge, republican floor leader of the senate, who was angered because Secretary Hughes had requested the Japanese ambassador to write the note to be sent from the department of

state direct to congress, without having it first referred to the foreign relations committee of which Senator Lodge is chairman, and because, in addition, Senator Lodge is not on good terms with President Coolidge and desires to embarrass him."

The story has not been denied. Bishop Reifsnider undoubtedly spoke the truth when he divulged the inside story of how Ambassador Hanihara was made the "goat" of American politics. "Hani," the most popular ambassador Japan has ever sent to Washington, realizing that his usefulness was finished, demanded to be recalled and since his return to Tokyo has announced that he will retire from diplomatic life.

In the same manner, Secretary Lansing destroyed the usefulness of Viscount Ishii and made his further presence in Washington untenable over the matter of the appointment of a financial adviser to the Chinese government. The Chinese and Japanese desired the appointment of Baron Sakatani for this post, but before taking any action, Ambassador Ishii, acting under the instructions of his government, approached Secretary Lansing to ascertain if the American government would oppose this selection. Mr. Lansing stated that his government had no objection to the appointment, and on the strength of this, Ishii cabled Tokyo to that effect and the appointment of Sakatani was publicly announced. The fireworks then started in Peking. Minister Reisch kept the cables hot telling Washington how American acquiescence in the appointment of a Japanese financial adviser to the Chinese government would be construed as a recognition of the doctrine of Japan's special interests in China, and other arguments which found credence in those days. Minister Reisch protested the appointment and raised such a stink over the affair that the Japanese government found itself in a most embarrassing position. Secretary Lansing disclaimed ever having given any assurance to Viscount Ishii, thus completely destroying his further usefulness at Washington, making necessary his recall and the appointment of a successor. Bishop Reifsnider's disclosure would seem to be another instance of where a Japanese diplomat has been retired through the vagaries of American statesmanship.

* * *

Six Months Prisoner—A Review

NOT only as a human document is Mr. Elly Widler's "Six Months Prisoner of the Szechuen Military" of importance to the observer of China and things Chinese, but coming just at this time when pleas for the abolition of extraterritoriality are rising from the Chinese on all sides, the book is worthy of close study. The author tells a plain unvarnished tale, disclaiming literary ability, in the desire to get his story before a public that knows next to nothing of the contacts between Chinese of the dominant military class and the foreigner who is isolated in some port far from the legation quarter to which reports of occurrences, such as Mr. Widler outlines, filter very slowly and sometimes never reach the diplomat at all.

For several months Mr. Widler endured the discomforts of a Chinese jail, cold and hunger his daily portion until the work of influential friends began to shake the confidence of the Chinese in their ability to hold a foreigner prisoner indeterminately, and as sudden as was his arrest, came the order for release. Many interesting sidelights are cast upon Chinese customs, especially those that prevail in prison and much of human interest accompanies the prisoner's tale of his sufferings. The book is not in the least harrowing and has many droll touches in depicting various men and events. Not only Mr. Widler, but various writers in the public press, comment on the disinclination of the Chinese to permit investigation of their admirable (on paper) penal code which afforded the victim of Chinese tyranny no relief, no trial and treated him as did the feudal lords of the XIII century their prisoners. As a comment on the inadvisability of abolishing the extraterritorial rights of foreigners to be tried by their consuls instead of falling under the tender mercies of a Chinese (so-called) court, the book is worthy of wide circulation.

Japanese-American Co-operation

Established on a Firm Basis

Expanding Markets for American Materials

A Vicious Misrepresentation

ONE of the brightest outlooks for the expansion of American trade and engineering practice in Asia is the remarkable increase in American co-operative enterprises in Japan, not only in the matter of loans but in the equally if not more important fields of engineering and industry. Before taking up the main subject of this article, we desire to correct a statement now going the rounds of the anti-Japanese press in regard to the use of the American loans to Japan. In a recent number of THE FAR EASTERN REVIEW we invited attention to the total amount of American loans to Japan during the past year, aggregating some \$212,000,000. The bulk of these funds (\$150,000,000) went to pay for reconstruction material purchased in America. At least half of the Daido Electric Power Company's loan of \$30,000,000 also went to pay for American electrical machinery, the balance, to retire outstanding indebtedness.

The Oriental Development Company's loan of last year amounting to \$10,000,000 has been expended almost exclusively in the legitimate activities of this company in Korea, while the recent issue of \$22,000,000 to the Industrial Bank of Japan has been used for the general business of the bank and although not stipulated or admitted, it is currently assumed that this loan has enabled the bank to carry its obligations and protect

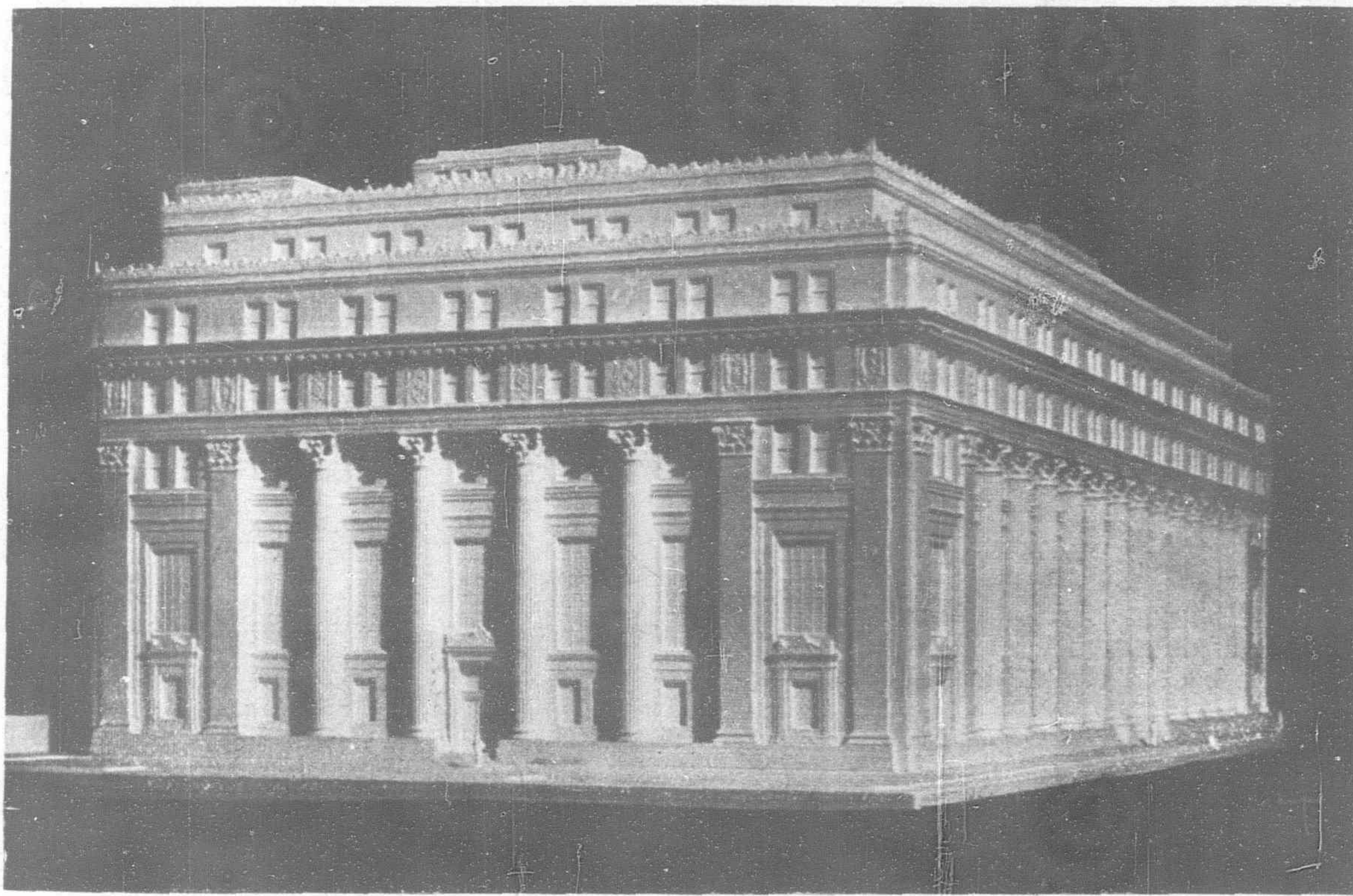
the Japanese bondholders of certain defaulted Chinese government issues which come under the general head of the so-called Nishihara loans. As far as we have been able to discover, not one cent of these American loans has been diverted to uses outside of Japan. Yet anti-Japanese writers in China would make it appear that the bulk of these loans has been used in some manner not specified to advance Japanese interests in China. If these anti-Japanese writers could understand that Japan has invested several billions of yen in legitimate enterprises in China and which brings them in less returns than if the money had been permitted to draw interest in a Japanese bank at home, their common sense would tell them that Japan at this particular period is not throwing good money after bad. Aside from the new capital required to finance the legitimate enterprises of the South Manchuria Railway Company and a few private industrial plants scattered throughout China, the Japanese are keeping their money at home. Instead of using the American loans to compete with or close the door to American opportunities in China—opportunities we have never taken advantage of—the

Japanese are loyally playing the game, reciprocating by doing everything within their power to encourage further co-operation by employing the best American technical talent for the reconstruction and remodeling of their major industrial establishments and municipal improvements.

Fuller Company's Activities

It is only necessary to mention a few instances to support this assertion. When the great Mitsubishi interests determined to erect several modern steel office buildings in the heart of Tokyo's business district, they called in the Geo. W. Fuller Company of New York, and formed an American-Japanese construction company to undertake the work. As a result of this step, American building methods have obtained a firm foot-hold in Japan, assuring to American manufacturers the major part of the orders for modern steel construction materials as well as the many side lines of builder's hardware.

To the several handsome office buildings erected by the Fuller Company of the Orient in the business centre of Tokyo, they are now completing for the South Manchuria Railway Company at Dairen the finest hospital in Asia, barring none. Not even the famous Rockefeller Institute at Peking can outdo it in the completeness of its fittings and the modernity of its interior design. There are other large modern



Architect's Model of the New Mitsui Building to be Erected in Tokyo

buildings now being planned by the S. M. R. Company for erection in Manchuria and there is every possibility that the same American-Japanese construction company will secure the contract. This has introduced modern American building methods into China on a scale that otherwise would have been difficult for Americans to carry out. The Dairen hospital will stand before the Chinese as an example of American construction that will have the same advertising value for our building methods as the American equipped S. M. R. has had on engineering specifications in China.

The great Mitsubishi interests of Japan have combined with the Westinghouse Electric Manufacturing Company to form an American-Japanese enterprise for the manufacture of electrical machinery in Japan and a huge modern plant is now in course of erection. It will also be built to standard American specifications.

Truscon Steel Construction

The Truscon Steel Company of America has combined with Japanese capital, in the formation of an American Japanese company

to handle its products in Japan and has been eminently successful in extending American reinforced steel and concrete construction in that country. Many of the handsome buildings and new industrial plants in the course of erection in Japan are being built to their specifications. We have published in a previous number of *THE FAR EASTERN REVIEW*, the particulars of the contract awarded to the Stuart Company of New York for the erection of the great Mitsui building which will cover a square block and house all the various offices of the numerous Mitsui activities.

Foundation Company in Japan

Another leading firm of American engineers encouraged by the prospect of obtaining the contract for constructing the subway system for Tokyo has also started business in Japan.

The Foundation Company of New York has now secured several contracts for important reconstruction work in Tokyo, amongst which are the piers for the first two of the five projected new bridges which are to span the Sumida River as part of the Greater Tokyo reconstruction plan. The two bridges whose piers are to be built by the Foundation Company will be 579 feet in length and besides the piers at each end will have two piers in the river. The steel work for the bridges will be constructed in Japan. In building these piers the contractors will have to go down perhaps 100-ft. to find a firm foundation, necessitating the use of the pneumatic system in excavating. The contract provides for their completion in ten months after work starts. The cost of the two bridges will approximate Y.2,000,000.

The H. K. Ferguson Contract

On the outskirts of Yokohama, the first unit of the new works of the Shibaura Engineering Works is nearing completion, another huge Japanese industrial plant going up on purely American lines. This company, closely affiliated with the great Mitsui interests is associated with the General Electric Company of America in the manufacture of electrical machinery and appliances of all kinds and is the largest manufacturer of these products as well as industrial machinery and machine tools in Japan. The old plant at Shibaura, a familiar sight to all who travel between Tokyo and Yokohama, was found too small and scattered to be efficient, and in order to handle the constantly increasing output, the company decided long before the earthquake to erect a complete new plant on a new site. These plans provide for two units of five buildings each, covering a total floor space of five acres per unit, each building being 900 feet long by 300-ft. wide. The plant is designed to provide for the same type of quantity production as is typical in the larger factories of America, a system that will tend to increase efficiency and lower the cost of production in Japan and permit the products of the Shibaura Works to enter into a more active competition for Chinese requirements.

The erection of this up-to-date plant was entrusted to the H. K. Ferguson Company of New York, whose vice-president, Mr. J. S. Ruble, has been in personal charge of the designing and erecting work. This contract is considered as another victory for American methods in Japan and exemplifies once more the close friendship of the Mitsui interests for America.

* * *

Asiatic Consumption of Western Staples

A New Factor in Economics

BBRITISH woolen manufacturers are congratulating themselves on the development of new markets for their products in China and Japan which last year became the largest purchasers of British woolens. In seven months of this year, China has purchased 14,028,000 square yards against 6,576,000 in 1913. Japan, which eleven years ago took, 7,661,000 linear yards has in the past seven months taken 17,683,000 square yards. Between them these countries have purchased nearly a third of British shipments of woolen piece goods, in addition to some 7,892,000 square yards of

worsted cloths, or close upon a quarter of the total worsted exports from Great Britain.

This new tendency in world trade will have its effect upon prices at home and make things dearer for the American and European consumer. There is little doubt of the wonderful possibilities in world trade if the peoples of China and Japan adopt the same dress and eat the same food as the Occidental. For instance, if the Japanese should become beef, instead of fish eaters, the increased consumption in the east would send the price of beef soaring skyward in the west. If the Chinese should follow suit, we would probably have to seek for some new food to take its place. If these peoples take to wearing foreign shoes where will the hides come from to furnish the material for another 500,000,000 to a billion pairs of new shoes each year? What will this tendency have on the price of shoes to the people of the west? The same applies with equal force to many other staples and articles of every-day use.

Increased sales of woolens to China and Japan will depend largely upon prices low enough to enable these thrifty peoples to buy, a difficult task when the world's wool clip for the next two years is likely to fall short. If the demand from the Orient continues, it means that the cost of woolen suits in America and Europe will go up while New Zealand and Australia will benefit by the increased price of wool and expand their purchasing power.

In a similar manner, the new demand for woolens and other occidental necessities synchronizes with the rapidly increasing taste of the Chinese and Japanese for wheat flour. This will make wheat dearer for the peoples at home until Siberia, Russia and Manchuria are once more brought under full cultivation. Last year, the Japanese consumption of wheat was 83 per cent. higher than it was ten years ago and most of the 31,500,000 cwts. the Japanese bought came from Australia. China, too, in nine months has purchased 2,000,000 cwts. from Australia. The dominant feature of China's imports during the first quarter of this year, aside from its purchases of British woolen goods, was the rapid increase in the purchases of foreign flour amounting to more than 2,185,000 barrels, a striking contrast to the 745,000 barrels imported during the same period of last year. The bulk of the flour imported into China comes from America and made China for the period mentioned, the largest world market for American flour. Thus, we have two new mouths to feed with wheat bread at a time when Russia's export is likely to be less than it was last year, and when the American and Canadian exportable surplus may be 5,000,000 tons below that of last year. That means dear bread somewhere else in the world but increased prosperity for Australia and New Zealand.

New Dredge for Basra

Messrs. Wm. Simons & Co., Ltd., Renfrew, launched on September 2, the cutter suction hopper dredger *Liger* which they have constructed for the Anglo-Persian Oil Co., for work at Basra.

The dredger has been constructed under the direction of Messrs. Rendel, Palmer and Tritton, consulting engineers, London.

The vessel is fitted with two sets of triple-expansion surface-condensing engines, and steam is supplied by two cylindrical multitubular boilers, fitted with forced draught and oil-burning installation.

The dredging outfit consists of a set of triple-expansion engines, driving a centrifugal pump, coupled to a suction pipe, fitted in a frame carrying a cutter, designed for disintegrating compact material, the cutter being driven by gearing from an independent set of compound engines. The suction frame is designed to dredge to a depth of 40-ft. under water, and arranged to take a drag suction nozzle when required. "Simons" patent suction keelsons are fitted to the hopper, so that the load may be discharged overboard through a floating pipe line, in addition to the usual bottom discharge by means of doors.

The engine room outfit includes independent condensing plant, automatic feed pumps, bilge pumps, service pumps, filter and evaporator. An outfit of machine tools is provided, capable of dealing with minor repairs.

Huge Shale Oil Distillation Plant for Fushun

How Japan will Solve Her Fuel Oil Problem

Manchurian Shales can Supply 1,500,000 Tons of Crude Oil Annually for Two Centuries

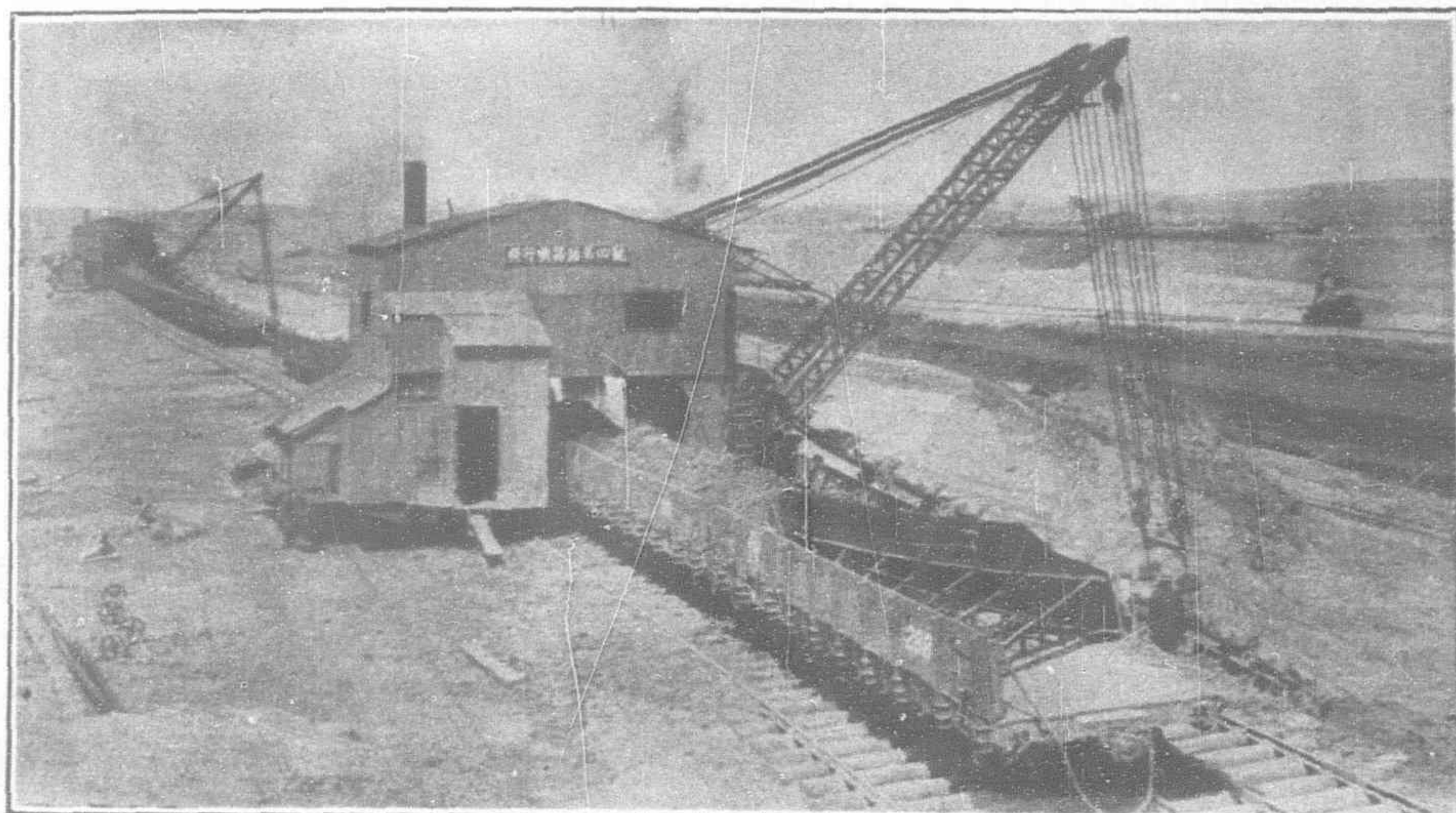
WHAT promises to be one of the greatest industrial undertakings of its kind in the world is now on a fair way to be realized by the erection of the initial unit of a huge dry distillation oil shale plant at the Fushun collieries of the South Manchuria Railway Company. The entire coal deposits of Fushun are overlaid with an oil shale stratum that has to be stripped and carted away in order to work the coal seams, so the cost of extracting the shale, being chargeable to the cost of mining, more than offsets any possible disadvantages encountered in working similar deposits in other parts of the world. For the next half century at least,

will cost about Y.7,000,000. The Fushun shale averages eight per cent. of oil, though some of the samples test out as high as ten per cent. The plant, however, is expected to extract at least seven per cent., thus giving a total annual output of 50,000 tons of crude oil.

If the results from this preliminary plant are satisfactory, it is the intention of the S.M.R. authorities, backed up by the Japanese government, to enlarge it to a point where it is confidently hoped that the Fushun shale deposits will completely free Japan from oil importations from America. The S.M.R. authorities have already drawn up the plans and estimates for an expansion program to extend over a period of five years at a cost of some Y.50,000,000.

As there seems every reasonable prospect of this venture being a success from the start, the manufacturers whose apparatus is installed in the initial plant, will have paved the way for a very lucrative business.

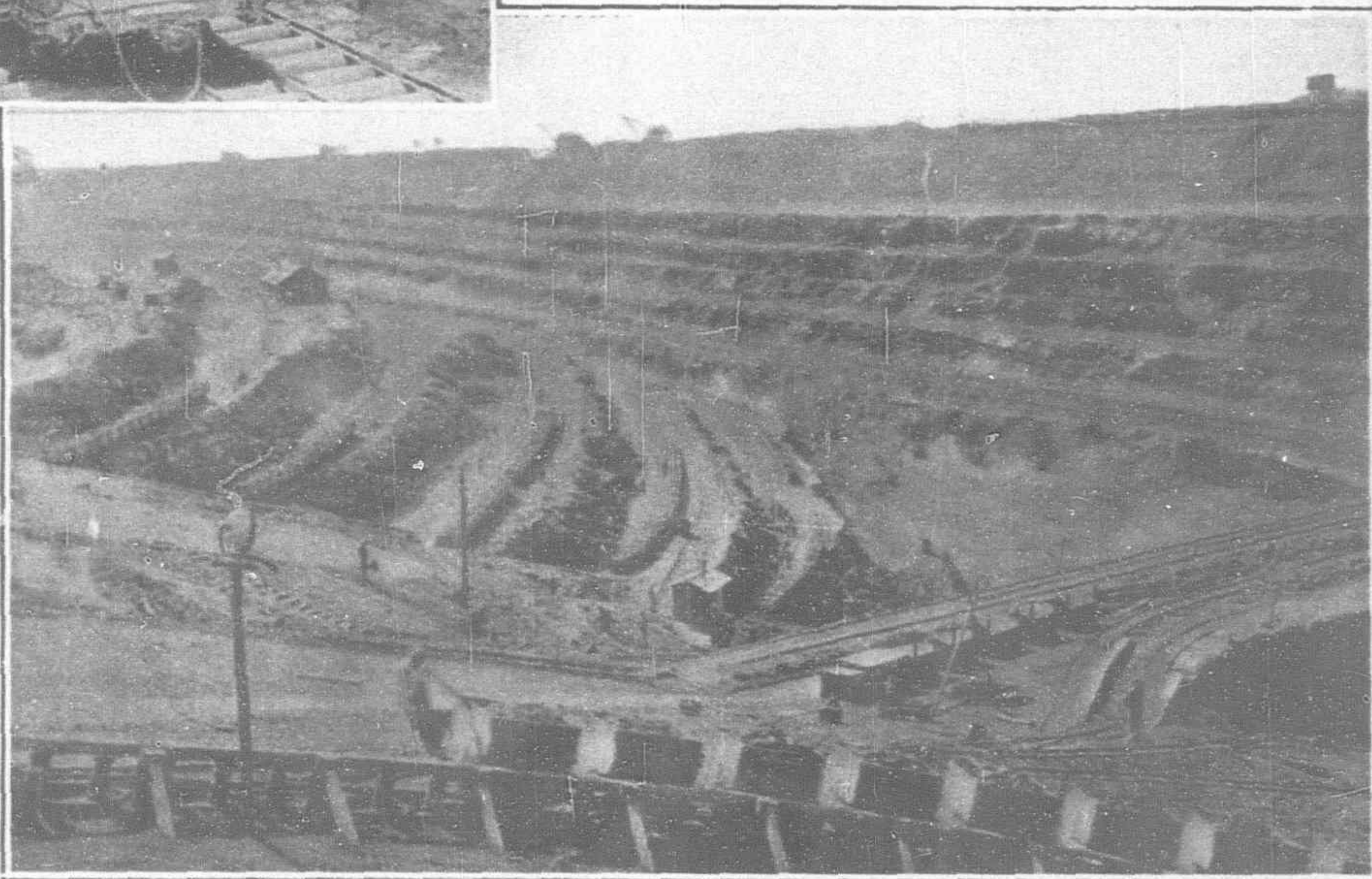
For Japan, the success of this Manchurian oil shale distillation enterprise is of more than ordinary commercial interest. Her existing oil fields are nearing exhaustion and she must fall back on Fushun and what she can manage to save out of the wreck of her Siberian adventure through negotiations with the Soviet for the control over certain Saghalien fields. It is not so much a business enterprise of the S.M.R. carried on for their particular profit, as it is of national security and prestige. Like England, during the world



Fushun Coal Mines: This view shows two of the large steam excavators stripping the shale from the new open cast coal workings at Fushun, delivering the shale direct into railway dump cars.

coal mining at Fushun will be confined in the main to working the immense open cast pits where the stripping will be performed by modern excavating machines delivering the shale directly into railway cars to be hauled the short distance of about a mile to a site already marked off for the dry distillation plant next to the new power house on the banks of the river and alongside the railway tracks. There are now three of these excavating machines stripping the new open cast workings and several American steam shovels of the Bucyrus make. The excavators are of German design built in Japan. It is altogether probable that when the oil shale distillation plant is working successfully several more similar excavating machines will have to be employed to furnish the shale.

The situation at present is that an expert of the S.M.R. is visiting America and Europe inspecting the various oil shale distillation plants in operation in order that the company may decide upon the very best apparatus for erection at Fushun. In view of the fact that the Fushun shale closely resembles that found in Scotland and that the tests on the Fushun shale have been conducted by Scotch experts, in all probability the order for the new Fushun apparatus will be placed in that country. The initial plant, we understand, will handle 700,000 tons of shale per year and



This view gives a good general view of the shale deposits covering the coal seams in the Fushun open cast workings

war, when the latter country awoke to the fact that she was outdistanced by the United States in the matter of oil fuel supply for her navy, Japan now faces the same problem. The British wasted no time in academic discussion but went to work with a will to develop the shale oil deposits in their own territory and reached out for a larger share in the exploitation of oil deposits in foreign countries. To England alone is due the credit for developing the oil shale industry to a point where it is now commercially profitable and

(Continued on page 488).

Far Eastern Harbor and River Improvements

Call for Huge Expenditure

RAPID expansion of commerce with the Far East coupled with the ever increasing tonnage and draught of the steamers in trans-oceanic trade has brought about such an acute need for greater harbor facilities and docks that more than \$100,000,000 is now earmarked for expenditure in the next few years for river and harbor improvements in China, Japan, French Indo-China, Macao, the Federated Malay States and Dutch East Indies. Most of these projects have passed the "paper" stage, some have been given governmental sanction, while several have been allotted the funds necessary for an immediate start of the work.

Any effective improvement of existing conditions must be preceded by adequate technical investigations into which two great factors enter. One is the feasibility from an engineering standpoint, and the other is whether the expenditure will be economically worthwhile. The second of these factors has led to an adverse report on the improvement of the Yangtze to enable ocean-going vessels to reach Hankow during the season of low water. According to Mr. F. Palmer, consulting engineer, the funds in sight not only are insufficient, but the improvement is not warranted by the advantages to be gained, he says in an exhaustive report on the subject.

The question of funds also enters into the project to improve the river approaches to Canton, but in this case the sale of reclaimed areas would pay 75 per cent. of the cost even if the costly bridge to connect Canton with Honam is included. So far as the projected improvements at Hongkong are concerned, only two small appropriations have been made, principally to cover expenses of consulting engineers, so that these schemes which also include reclamation of large areas that would cut expenses in half must be considered as in abeyance for the present.

The most urgent of these harbor works, undoubtedly is that to make the harbor of Tokio available for steamers considerably larger than the 3,000-ton ships that formerly were the limit in the area of that port. The plans for this much needed improvement have been drawn up by successive municipal administrations in Tokyo but invariably the scheme has been postponed because of the huge financial outlay, far exceeding the abili-

ty of the municipality to meet. The scheme as outlined below was finally taken over by the imperial government but its financing is still a matter which occupies considerable attention on the part of the authorities.

The Port of Tokyo

The home department announced some time ago that the construction of the Tokyo harbor and a canal connecting it with Yokohama had been definitely decided upon, the work to be started this year at an estimated cost of Y.46,500,000 covering a period of six years. The report stated that the Yokohama canal would cost Y.25,000,000 alone. This project will cut the present 24 miles of open sea lighterage to 16 miles and avert the dangers incidental to barge traffic on the exposed bay route. This scheme has held the attention of the authorities for many years as the expenses attached to the transshipment of cargo at Yokohama to the railway and the railway transportation charges between Yokohama and the capital is a heavy toll on merchandise destined for Tokyo and points north. Out of an average yearly 7,500,000 tons of cargo handled at Yokohama, 3,700,000 tons are destined for or shipped from Tokyo. The importance of the lighter traffic between the two points is better understood when it is known that only about 200,000 tons of this cargo is handled by the railway, leaving some 3,500,000 tons to be transported by lighter.

When the earthquake and fire destroyed Yokohama's harbor facilities and threw an increased load on the lighterage business the charges on cargo for Tokyo jumped from Y.1.80 per ton to Y.6

to 7 and even higher, equivalent to the rate charged on cargo between Yokohama and Shanghai. Lumber which paid a trans-pacific freight rate of Y.12 a ton, was assessed an additional Y.7 for the 28-mile lighterage from Yokohama to Tokyo. This traffic gave employment to some 8,000 lighters of which 60 per cent. were destroyed during the fire, leaving 3,000 to cater to the abnormal traffic which ensued. The resultant exorbitant charges reaching as high as Y.15 per ton for cargo forwarded from Tokyo to Yokohama with additional loading charges of Y.4.20 in Yokohama harbor with a



demurrage charge of Y.4 a ton and other stevedoring and incidental charges was such a tax upon commerce that the authorities were compelled to give immediate attention to the proposed canal scheme in order to ameliorate what threatened to become a prohibitive tax on materials for the reconstruction of the capital, and the development of its industries.

As a complement to the canal scheme the Tokyo harbor project involves the construction of mooring berths having a depth of $7\frac{1}{2}$ metres at low tide along the water front of Tsukijima and Shibaura, and the dredging of the bay area to the same depth off the old Shinagawa forts in order to provide a channel that will permit steamers larger than 3,000 tons to dock at the Tokyo wharves. The principal improvements at Tokyo will be concentrated along the foreshore at Shibaura. Here in 1922, the Tokyo municipality had started on an improvement program that was to cost Y.6,800,000. This work was, however, temporarily cut short by the earthquake, and since then the original plans have been somewhat modified. For the present, work is being carried on in erecting sea walls and bunding and in dredging the channel out into the bay. Here two municipal dredges are at work. The first object of the authorities is to make feasible the entrance of 3,000- to 4,000-ton coasting steamers relieving Yokohama of the strain of handling domestic cargoes consigned to the capital. Private concerns are busy erecting warehouses in this district with an eye to future enlargements.

According to the municipal plan, the Hinodecho shorefront will have a long jetty projecting to the length of 310 *ken*, or 1,860 feet, from the shore. The jetty will have a breadth of 42 feet.

On the completion of jetty, four steamers of 3,000 tons class can be accommodated at a time. Eight steel-trussed goods sheds having the total floor area of 5,124 *tsubo* are now under construction and will be completed by the end of October. Cargo discharged here will be kept in storage in these sheds to serve the shippers' convenience. At the same time, the water area at Shibaura will be dredged deeper than ever. The bunding work involves the construction of a 4,000-foot wall.

Yokohama's Rapid Recovery

Although the greater portion of Yokohama's wharves, quays, breakwater and other harbor facilities were destroyed and are not expected to be re-established very soon, the solid work for reconstruction and reparation of the port is progressing successfully and shows great promise for the near future.

Immediately after the disaster, the government commenced repairs to meet the temporary requirements, spending Y.2,800,000 as an emergency expense. During the season 1923-1924 it is going to spend Y.7,000,000, for the reconstruction of the harbor on a more ambitious scheme than before the earthquake. Although there is only one pier left, it can moor at the same time four large Trans-Pacific passenger boats, ranging in length from 550 to 660 feet. It is noteworthy that the depth of the harbor has not been affected by the earthquake.

Every facility is now restored and foreign traders are assured that export and import business can be carried on with the same freedom as before the earthquake.

Warehouses and Lighter Facilities

Since the earthquake, exporters and importers of Yokohama have suffered greatly from the scarcity of warehouses. Special efforts were made to have the damaged warehouses and sheds repaired and also to build new ones. According to the report of the Yokohama municipal authorities, the are a of warehouses and temporary depôts provided for export and import cargoes are as follows:

| | Pre-earthquake. | April 1924. |
|------------------------|-----------------|--------------|
| | <i>tsubo</i> * | <i>tsubo</i> |
| Warehouses | 59,991 | 46,184 |
| Temporary depôts | 28,507 | 16,002 |
| Open depôts | 34,774 | 117,915 |
| | 123,242 | 180,191 |

(*1 *tsubo* equals 6-ft. by 6-ft.)

From the above figures it is obvious that the restoration of warehousing facilities has made rapid progress, and at present there

are few difficulties and inconveniences connected with the importing and exporting of cargoes.

The number and tonnage of lighters pre-earthquake, and at present is as follows:

| | Number | Tonnage. |
|----------------------|--------|----------|
| Pre-earthquake | 2,828 | 227,040 |
| Burnt | 902 | 72,160 |
| Missing | 211 | 16,880 |
| At present | 2,184 | 174,720 |

Determined to retain the maritime position of the port the Yokohama municipal authorities have perfected plans for further enlargements under a fourth period expansion scheme. The landing capacity of the harbor to-day, is 9,500,000 tons and upon the completion of the third period expansion scheme, now in progress, there will be an addition of 2,500,000 tons, making a total of 12,000,000 tons. Under the fourth period expansion scheme breakwaters will be constructed between Juniten, Hommoku, and the entrance to the Tsurumi river, Tsurumi. The new enterprise, it is estimated, will cost Y.65,000,000.

The Yokohama municipality has approached the central government with a request that it undertake the construction of a new breakwater between Juniten and the Tsurumi river, on condition that all other necessary arrangements inside the new breakwater should be carried out by the local municipality.

Further, the Yokohama authorities will undertake the reclamation of the sea-front near the entrance to the Tsurumi river to the extent of 650,000 *tsubo*, of which 200,000 *tsubo* will be utilized for the construction of roads, a canal, etc. The remaining 450,000 *tsubo* will be rented to individuals and companies for the construction of factories and workshops. From this particular source, the authorities hope to obtain receipt of Y.1,620,000 annually.

A municipal loan of Y.14,000,000 is to be floated, either at home or abroad, for starting the above enterprise.

In presenting the foregoing information the Yokohama chamber of commerce adds a few comments on the problems connected with the construction of Tokyo harbor.

The proposed construction of Tokyo harbor was planned by the municipal authorities of Tokyo, but finding it entirely beyond their ability to accomplish such a scheme, the government had to take up the matter and tried to complete it under its own management. However, up to the present, due to financial difficulties, it has not achieved any success. Although it is unknown at present when and by whom the scheme will be carried out, there is reason to believe that the plan for the construction of the port of Tokyo will materialize some day, for the necessity is fully realized by both the government and the citizens.

According to careful investigations made over the various plans hitherto published, the construction of Tokyo harbor will not bring forth any competitive factors against the port of Yokohama, as the plans do not propose to make it the calling station for ocean-going steamers, but for coastal vessels only of about 5,000 tons. This will be done by dredging the Tokyo side up to 25-ft. The consensus of public opinion is that the building up in Tokyo of a port as big as the present port of Yokohama is not only unnecessary, but an unbearable financial burden for the nation. From the foregoing, it is hardly necessary to add that Yokohama will certainly remain as one of the foremost ocean trade ports of Japan as well as a portal to Tokyo from abroad, even assuming that another port might appear in its vicinity in the future. The construction of the canal between Yokohama and Tokyo, the plan of which has been practically decided upon and will be accomplished sooner or later will also lead to the future prosperity of the port of Yokohama.

The latest announcement made by the government is to the effect that wharves at Yokohama, including the warehouses will be completely reconstructed by March, 1925.

Modern Harbor for Shimidzu

Situated in the heart of Japan's tea district, the port of Shimidzu is being improved by the harbor authorities of the home office to take care of the increasing trade for the Shidzuoka district. Many of the vessels which enter the port are great trans-Pacific liners loading tea cargoes. These anchor about $1\frac{1}{2}$ miles from shore and receive their cargoes from lighters. The new improvements started in 1922 will consume about six years and cost about Y.5,500,000. In the main, the operations consist of dredging a deep-water

basin and using the dredged material to reclaim land to be used in connection with a railway terminal to permit the transfer of goods direct between the railway cars and ship's side.

In the accompanying map the area proposed to be dredged is shown by dots, the shaded area representing the land made or at least developed by reclamation. The parts of the deep-water basin adjoining the section of the reclaimed land where it is intended to accommodate ocean-going vessels will vary in depth, 600 feet of the frontage mentioned facing water 35 feet deep, another 600 feet facing 30-foot water and 780 feet facing 24-foot depth, while the remainder of the deep-water basin, extending almost due north from the sections mentioned, will be of 35 feet deep, all these figures having reference to depth at low water. The dotted section of the Tomoegawa River, which cuts in two the reclaimed area, will be dredged to a depth of six feet and will be used as a shelter for fishing craft. The entire dredged area will measure 117,000 *tsubo* (one *tsubo* equals 36 square feet). The reclaimed area will be divided into two sections by the Tomoegawa River, of which that facing deep water will consist of an area of 23,000 *tsubo*, while the reclaimed land south of the stream will measure 90,000 *tsubo*. The former section will be used for terminal facilities, sheds and the like. The latter will be employed partly for railway terminal, while the remainder thereof will be used for industrial purposes and will be given over to private persons or concerns, though whether it will be sold outright or only leased has not as yet been decided. A bridge will be built across the river in order to connect the two sections of reclaimed land, and the railroad which now goes only as far as the sampan basin will be extended to the reclaimed area.

The dredging is being carried out by a bucket dredger and the material placed in scows which convey it to a suction pump by which it is distributed over the reclaimed area. The new improvements will be more than sufficient to handle a traffic of over 300,000 tons annually, or more than sufficient to meet the requirements of the port for some years to come.

Enlarging Kobe Harbor

In our September 1921 number appeared a full official report on the Kobe harbor improvements, since when, the Japanese government has adopted a nine years extension program that will call for an additional Y.62,500,000 expenditure, of which the government will pay Y.32,500,000 and the city of Kobe the balance.

The present extension was provided for in the original port improvement plans and calls for the enlargement of the harbor from 3,000,000 *tsubo*, its present area, to 5,000,000 *tsubo*. This scheme provides for the extension of the present breakwater, which when completed will consist of five sections aggregating 21,546 feet in length with two main entrances each 990 feet in width and two smaller entrances each 300 feet in width. At present only 7,812 feet of breakwater has been completed representing a cost of Y. 2,670,000. The entire breakwater is estimated to cost Y.15,000,000.

The present harbor extends from Wada point to Wakinihama but the new harbor area will be bounded by Wada point and Shin-saiki. The new extension will add four piers for berthing foreign trading steamers to the present three piers used exclusively for this service. Reclamation work and quays

now under construction for the berthing of coastwise steamers will cost Y.9,300,000 of which one-third is being defrayed by the government and the balance by the city of Kobe. In addition, the Kobe authorities are compromised to spend Y.10,000,000 for the construction of railway facilities and the erection of new warehouses on the new quays.

The Hakata Harbor Project

The contract for this work has been given to an American engineering firm of Shanghai, the Asia Development Company, headed by Mr. Paul Page Whitham and expert in river and harbor work. Mr. Whitham is now in the United States in an endeavor to raise the capital for carrying the scheme into execution. A full description of this work will appear in the next issue of THE FAR EASTERN REVIEW.

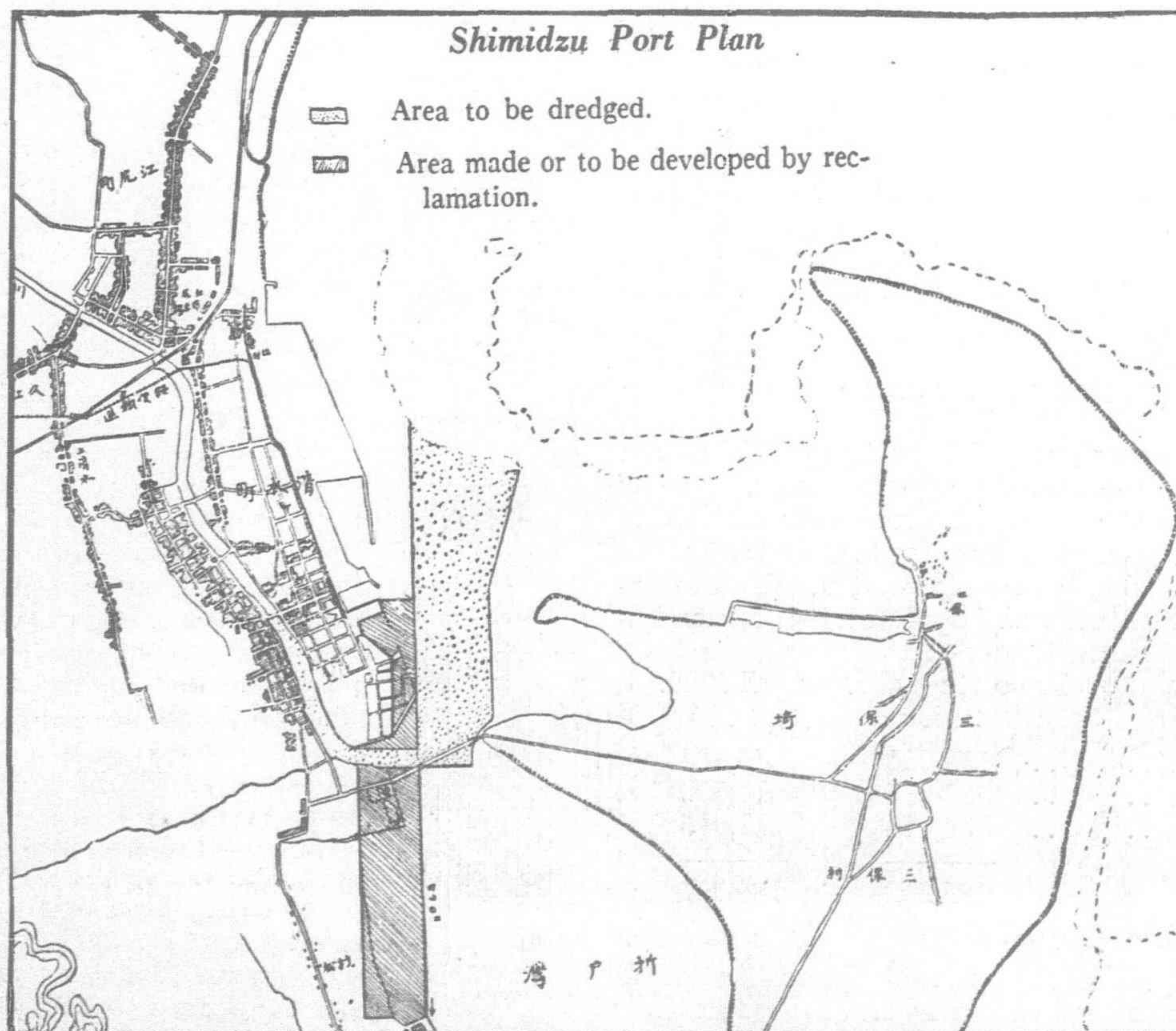
Harbor Improvements in China

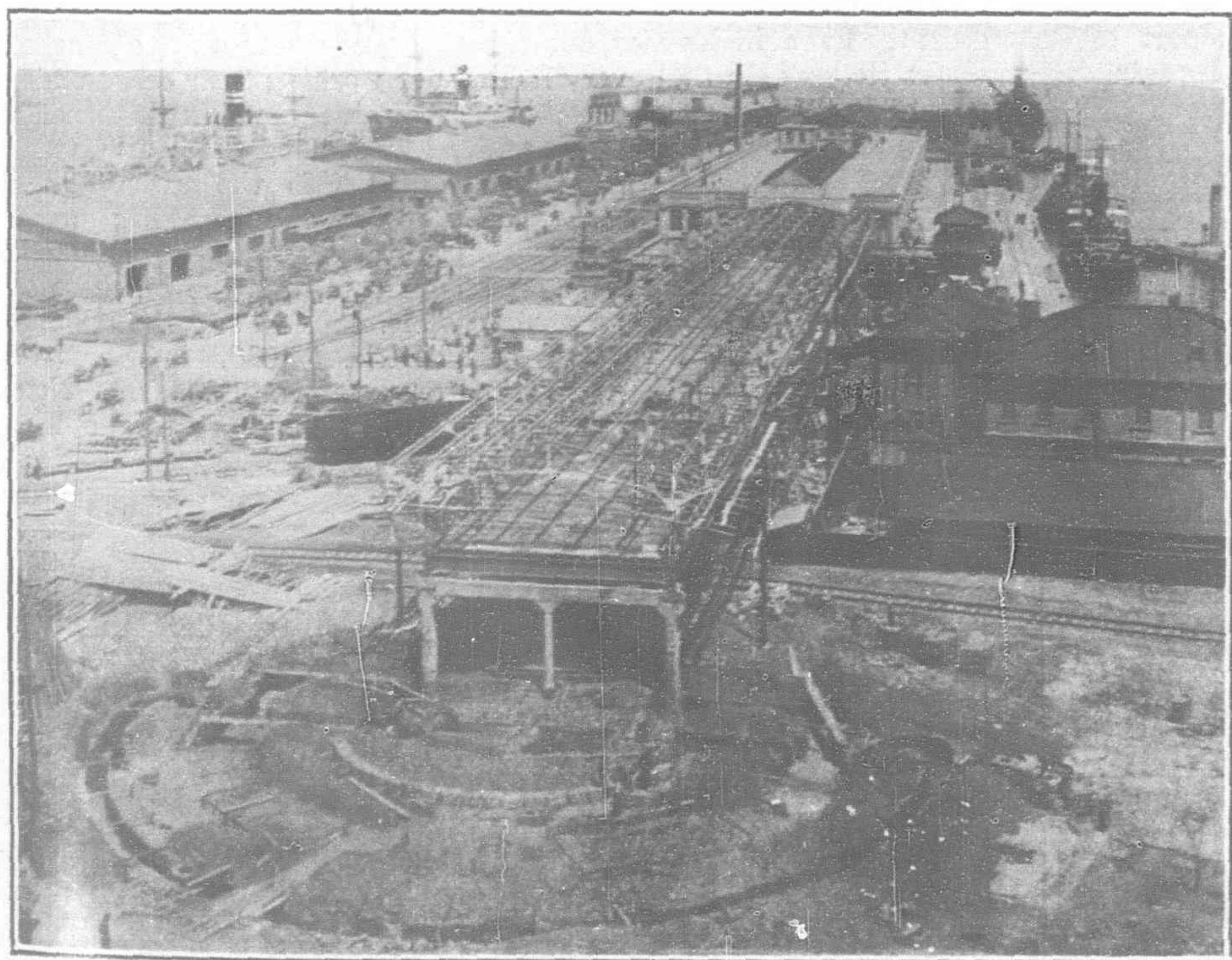
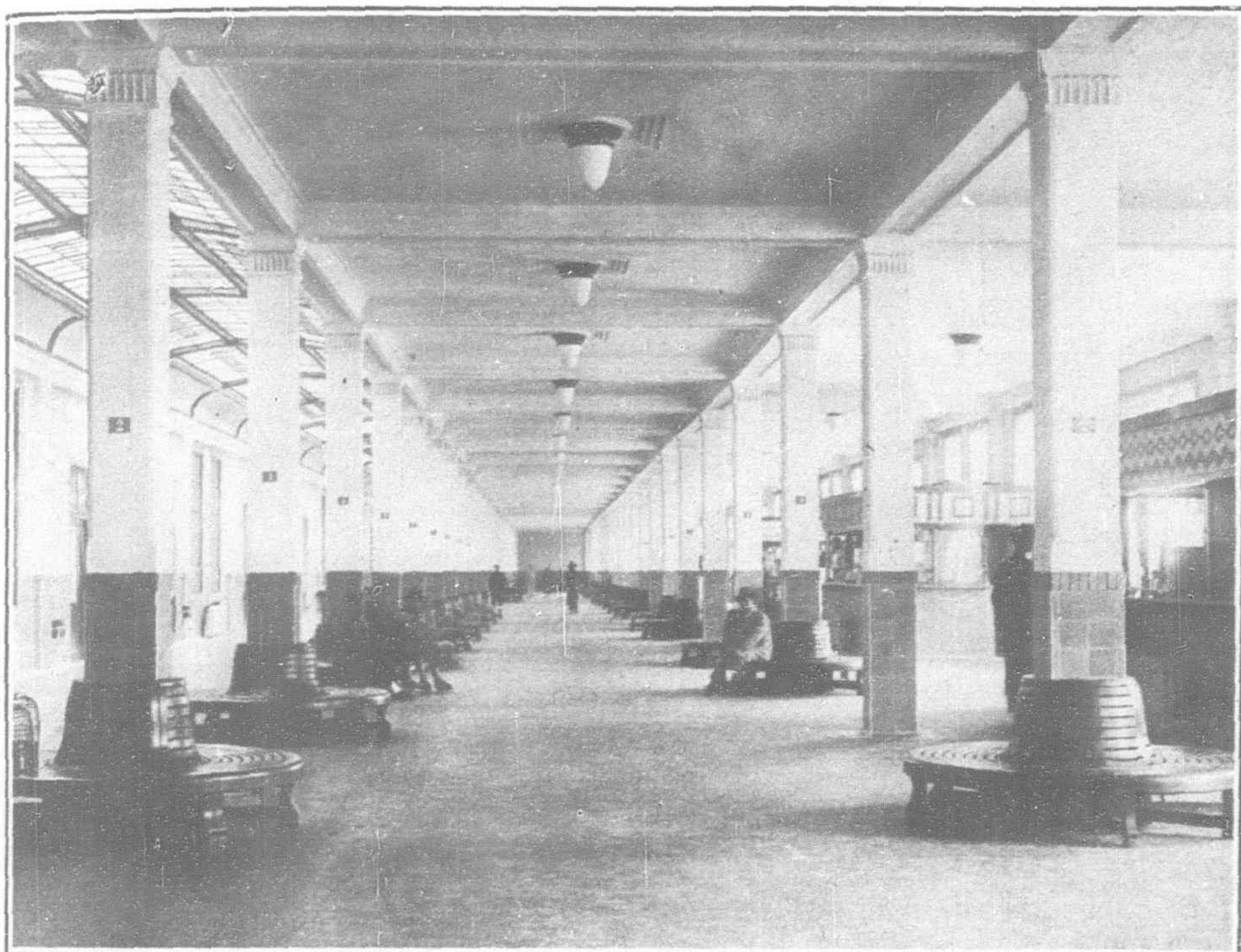
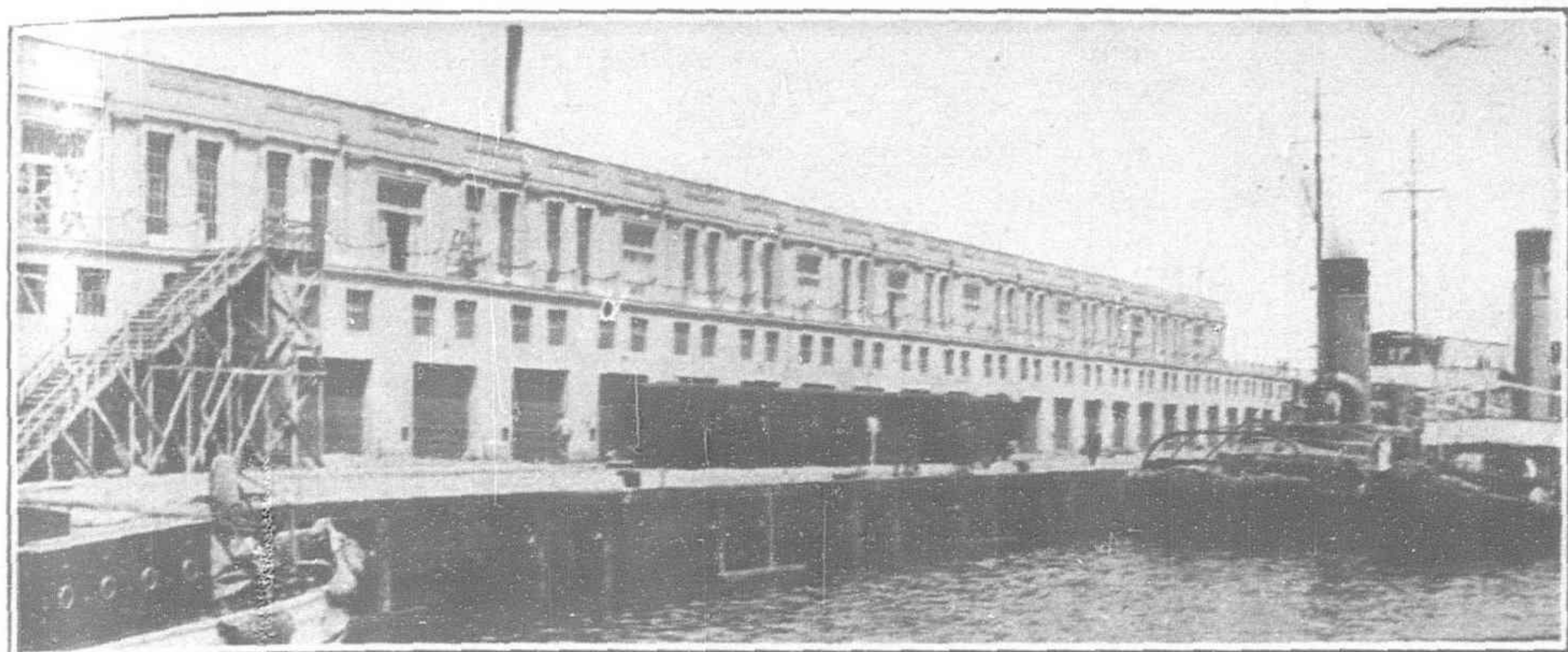
In reviewing briefly the many schemes for improving the rivers and harbors of China we confine ourselves to such works as have not already been fully described and illustrated in previous numbers of this magazine. Amongst these are the Chefoo and Chinwangtao harbor works, the ports of Dairen, Tsingtau and Newchwang, the Fitzmaurice scheme for Hongkong and the project for a new harbor for Shanghai. Considerable space might be devoted in describing projects for the minor ports which have small of hope of being carried out under present conditions and considerably more space might be wasted in reviewing the many river and canal conservancy schemes covering nearly every district in China, but as these are all in the embryo stage and with little chance of ever being financed, they resolve themselves for the present into mere projects, many of which are designed and promoted by interested parties in the hope that they may serve as the basis for a foreign loan or be accorded consideration in the distribution of foreign flood and famine relief contributions.

Dairen, the Second Port of China

The splendid port works of Dairen, in many respects the best in the Far East, stand as a monument to Japanese enterprise. The work of construction and improvement has been vigorously pushed forward by the South Manchuria Railway Company until marvellous

changes have been wrought on land and water. A full illustrated description of these port works appeared in the June 1922 number of THE FAR EASTERN REVIEW. It is difficult to keep pace with the constant improvements, additions and extensions planned and carried into execution by the S. M. R. authorities in order to cope with the increasing volume of trade. New concrete warehouses with special cargo working appliances have taken the place of the old open storage system, a beautiful modern fire-proof office building houses all the different harbor offices and special equipment of all kinds has been installed and is being constantly extended to take care of the many





The Magnificent New Passenger Wharf at Dairen, erected by the S.M.R. Company. Unquestionably one of the finest of its kind in the world. This Wharf is still unfinished. It is to have a semi-circular entrance pavilion, built in ornamental concrete work which will add dignity to what is already a handsome structure

requirements of loading and unloading vessels. The handsome wharf office building referred to above is now having an addition built to it that will double its size, and a new up-to-date pier is nearing completion. This pier undoubtedly ranks as one of the finest in any port in the world, surpassing in its detail of construction and general appearance the pride of the Manila harbor board, Pier No. VII. A full and up-to-date description of the port of Dairen will appear shortly in a subsequent number of *THE FAR EASTERN REVIEW* and we content ourselves for the present with publishing three illustrations of the new passenger pier, whose entrance building is still under construction.

Tientsin's Fight to Maintain its Port

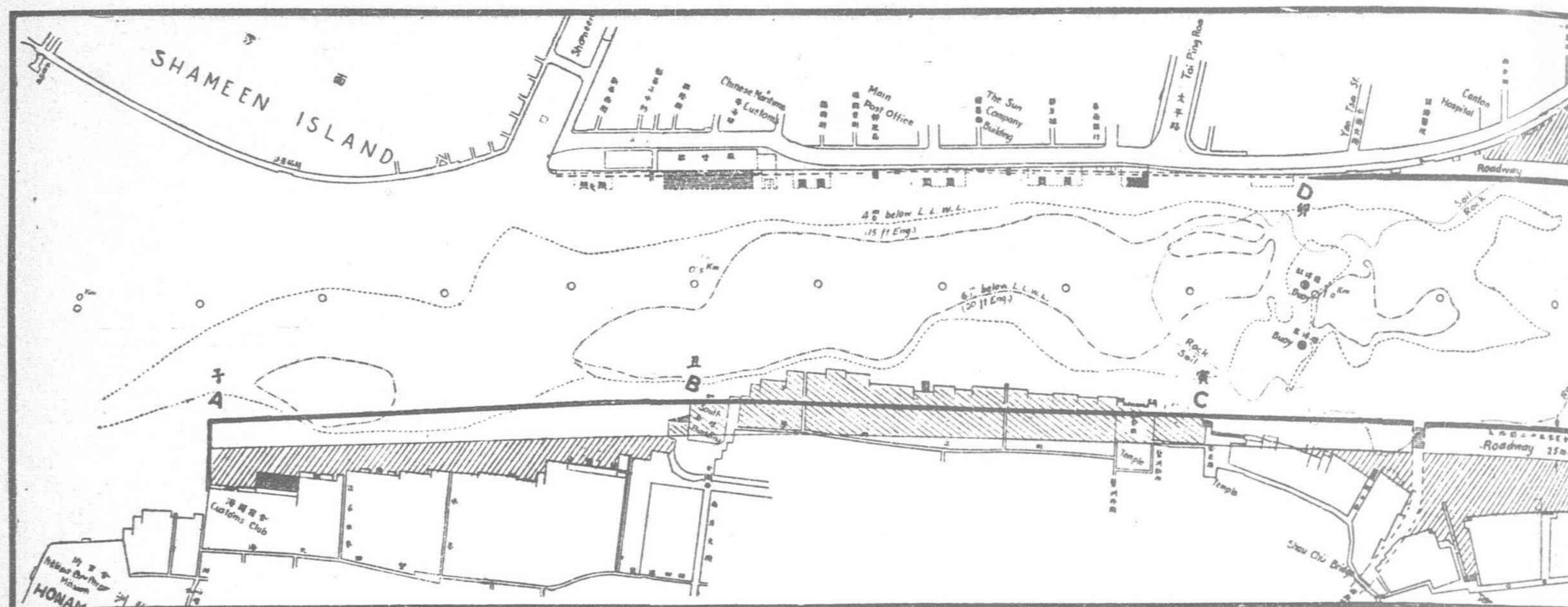
The problems confronting Tientsin's efforts to maintain its place as a coastwise port, in themselves quite formidable, are intensified many fold by the graver problems arising out of the inability of the Haiho to take care of the enormous flood waters that periodically devastate its hinterland. Two special commissions have been created to attend to these problems, one, the Haiho conservancy board, which maintains the river open to navigation from Tientsin to the sea, and the other the commission for the improvement of the river system of Chihli.

The work of the first body has progressed steadily and favorably since its creation, but each year seems to bring with it constant additions to the original project. Most of its work has consisted in making cuttings to straighten out the kinks in the Hai-ho's leisurely way to the sea, the work being performed by dredgers and excavators. A brief *resumé* of the Haiho conservancy work for the past ten years will give a general idea of the problems met with and solved in order that Tientsin may retain its position in the China coast trade.

What is known as the fourth cutting was opened to traffic on the 15th July, 1913. The total excavation was 865,000 *fang* and the cost was 27.3 candareens per *fang*. The third cutting, which was excavated by manual labor, cost 43 candareens per *fang*. The new cutting reduced the length of the river by 5.64 miles. The length of the river to-day is 36 nautical miles, whereas prior to the making of the cuttings the length was 48.8 miles. A new cutting—called Tombs Bend Cutting—was started in the spring of 1921, to be completed in the autumn of 1923. It will not shorten the river very much (about 1 mile), but eliminates four bad bends which hamper navigation and ice-breaking. The excavation is being done by dredger in a similar way as the fourth cutting.

Every technical authority who has examined the Haiho has urged the great improvement that would accrue in the propagation of the flood tide if the loop in the Peiho above the concessions could be removed, and in 1916 a company was formed at the instance of General Yang I-tê, and the expropriation of the site of the cutting carried out. The cutting was made in accordance with plans prepared by Mr. T. Pincione, engineer-in-chief to the Haiho conservancy board, under the aegis of the commission for the improvement of the river system of Chihli; but the cost was borne by the aforesaid company, which hopes to recoup itself by means of the land to be reclaimed in the old arm now cut off.

The beneficial effect of this work is evidenced in the improvement in the propagation of the flow tide whose rise and fall just above the cutting has increased by almost 3.5 feet. A subsidiary



Section of the Proposed Canton Harbor Improvements from Shameen to the Chu Kong Motor Boat Works.

followed that if the cost of dredging works reached Tls. 600,000 per annum, there would be no commercial justification in carrying them out. The finding of the commission is a severe blow to the commercial aspirations of several up-river ports, notably that of Chinkiang. Here a sitting up process has been going on for years and in time will close the port altogether to steamers. To improve the condition of the river at this port will call for training the Yangtze within normal lines for several miles at a cost of several million dollars, an expenditure altogether out of proportion to the trade benefits that might accrue to the port. This report practically sounds the death knell to Chinkiang's hopes which is told in so many words that it must adjust its future to the whim of the river. A perusal of the decennial reports of the maritime customs discloses that aside from a few futile attempts to improve certain dangerous spots in the up-river rapids, no serious improvement or port works have been carried out in the Yangtze.

The Port of Foochow

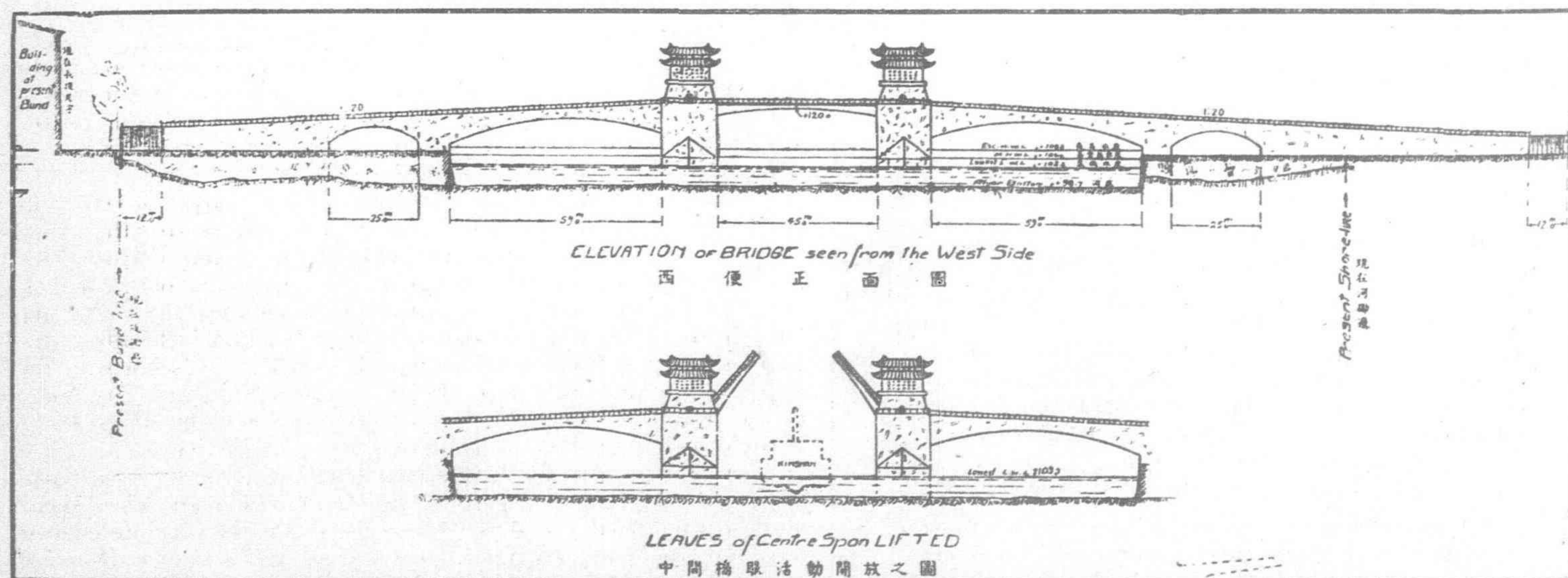
After many years of decline the port of Foochow bids fair to regain some of its lost maritime importance by the execution of a scheme now well under way for the improvement of the Min River which connects this city with the ocean.

For a number of years prior to 1919 mercantile and other interests of Foochow had under consideration projects for deepening the channel of the river to at least 10 feet, which would allow navigation of the channel at high water by steamers drawing 17

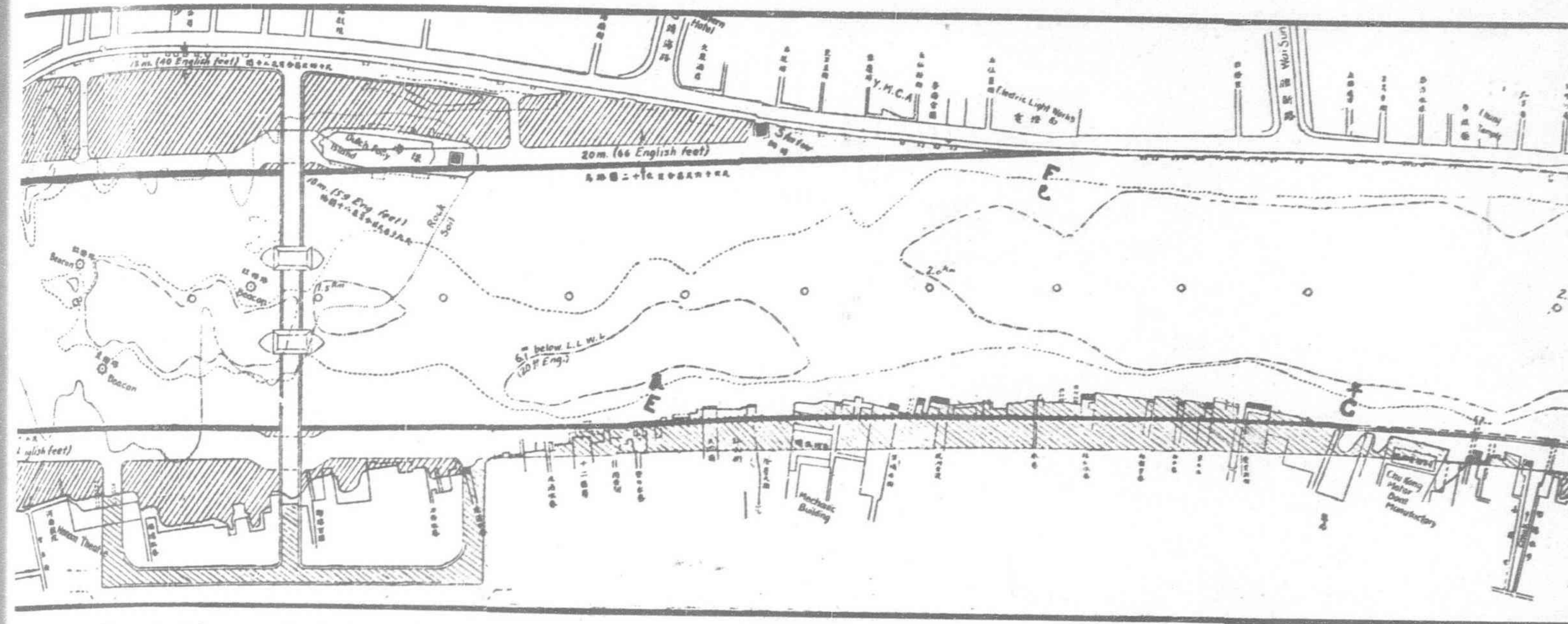
feet. With this improvement ships could then go to Nantai harbor, opposite Foochow, thus eliminating lighterage to and from Pagoda Anchorage.

The project, which owes its inception to Mr. T. T. H. Ferguson, commissioner of customs, received the official sanction of the Chinese government in 1919 and the Min River conservancy board was created, represented by both Chinese and foreign interests, which functions through an executive committee composed of two Chinese officials and one representative of consular officials.

The object of the Min River conservancy is to effect an improvement of the navigable channel from pagoda anchorage to Nantai harbor from a low-water depth of 2 or 3 feet to 10 feet, which would allow of high-water navigation of steamers up to 17 feet draft. The preliminary scheme was prepared by Mr. H. von Heidenstam, engineer-in-chief to the Whangpoo conservancy, Shanghai, and is being carried out by Mr. J. R. West, as engineer-in-chief. The constitution of the conservancy, drawn up in January 1919 and sanctioned by the Chinese central government and the diplomatic corps, provides for the necessary control by a general board and daily management by an executive committee; it defines the powers of the board or committee in collecting a special conservancy tax on the trade of the port, controlling the funds thus obtained, planning and executing works, engaging the necessary staff, etc. In December 1919 a loan of \$630,000 was negotiated with the inspector-general of customs, Sir Francis Aglen, who interested himself in the scheme and nursed it through a very critical stage. This money is secured on the conservancy surtax



Elevation of Proposed Bridge over the Pearl River at Canton



Showing Principal Areas to be Reclaimed in the Centre of Canton, the Proposed Roadways and Bridge Site

and has to be redeemed in a period not exceeding 20 years commencing from 1st April, 1922. So far the surtax collection has sufficed to cover expenditure, but the work is now approaching a stage of development which necessitates a greater outlay. For improvement purposes, the river divides itself into three sections: from Nantai to Lienpo, Lienpo to Pektao, and Pektao to the government dockyard at pagoda anchorage. The construction in the first section has been completed and that in the third section started. The second section has a good channel for nearly its entire length, and since there are two schemes for alignment in this section, there is every reason for leaving it to the last. It was hoped that the whole of the training works would have been completed in three years from the start, but certain factors were not taken into consideration at the commencement. It is estimated that a third of the time is wasted (that is, the work held up) by freshets, heavy rains, and typhoons. In the question of material the conservancy has experienced considerable difficulty in obtaining stone and bamboo in proportion to its requirements, making impossible to complete the work in the estimated time. However, the river already shows considerable improvement, and, although the shifting of the channel, due to the training works, still causes some inconvenience, there is no doubt that, on the whole, navigation is becoming easier.

The plan of work adopted and put into operation consists in protecting the banks and building training dykes on the concave side of the curves in the river, spur dykes on the convex side to cause contraction of the channel, and closing dykes across all secondary channels. By this method it is expected that the narrowing, straightening, and deepening of the channel will be largely done by the river itself. As the existing banks are scoured back to the desired line or when the new banks are built out to the desired line, they are protected by broken stone. The silting up of desired areas is effected by the construction of training dykes of stone or permeable dykes of planted bamboo or poles and brush; these cause, in addition to the slowing of the current and silting, the gradual diversion of an increasing amount of water into the main channel.

In the early part of this year the Min River conservancy board purchased through Duncan & Company of Shanghai for delivery this autumn, a suction dredger with an excavating capacity of 200 cubic yards per hour and 2,000 feet of pipe line. The dredger is made by Lobnitz & Co., Ltd., of Renfrew, Scotland, and cost £27,395. The employment of this dredger is expected to go far towards solving the difficult problem of controlling the heavy silting action of the Min River in the fairway below Foochow.

Hongkong Port Development

About a year ago we published the report and plans of Sir Maurice Fitzmaurice for the development of Hongkong's port facilities. This is generally known as the Hunghom Bay scheme, designed to meet every possible demand of the port for the next few

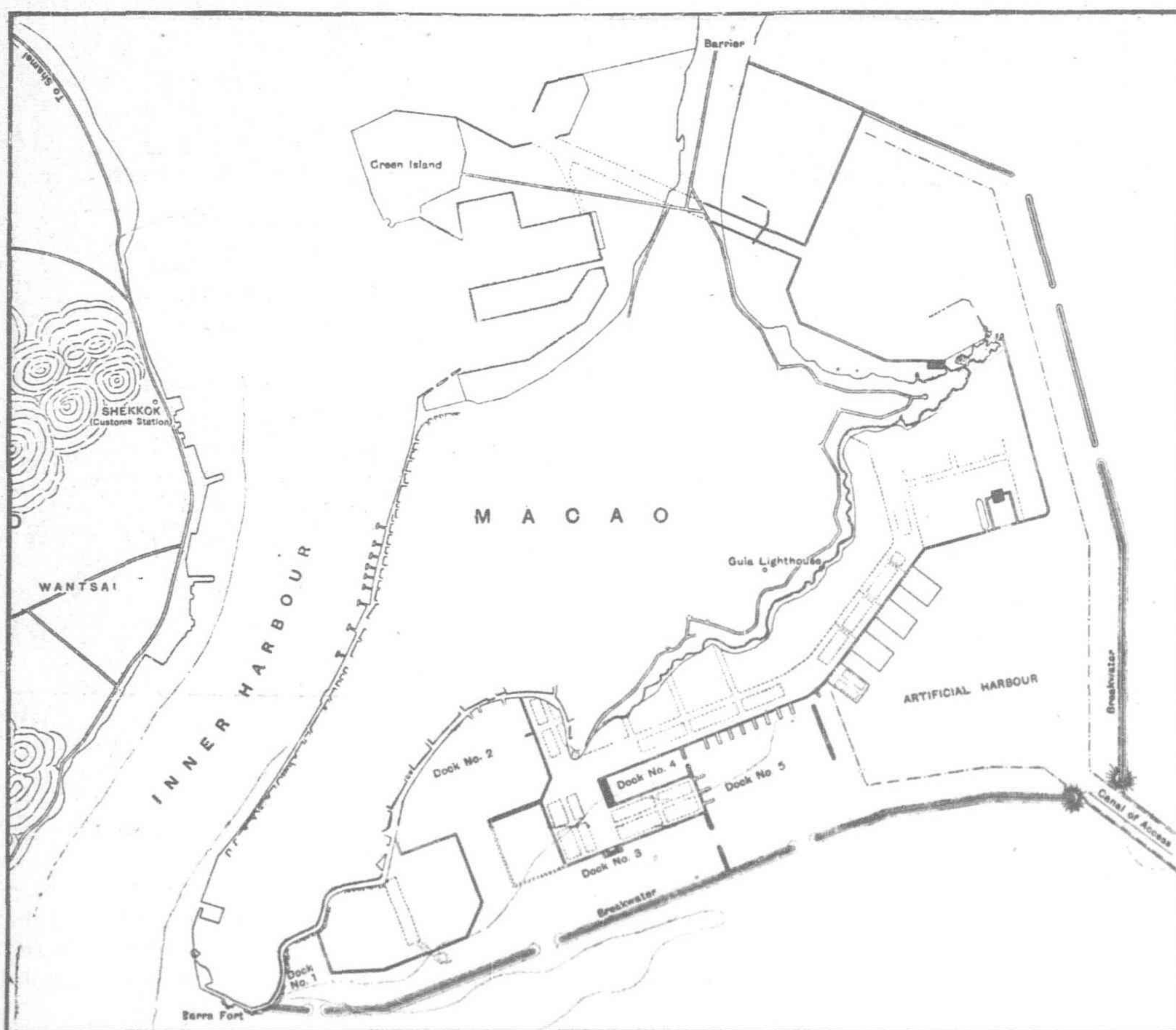
decades. Altogether there are four schemes in existence for the improvement of the harbor:

(1) The reclamation of about 48 acres in Hunghom Bay, from which a series of six jetties would project in a southerly direction. As a first instalment about 7 acres of reclamation with two jetties is proposed, at an estimated cost of £1,200,000, which does not include the cost of warehouses, railways, crane equipment, etc. (2) The West Point scheme. This is a scheme that was drawn up three years ago for Sir Paul Chater, and involves the reclamation of 800,000 square feet of land, giving an approximate area in marine lots of 363,000 square feet, and having a fairly deep water frontage. (3) The North Point scheme, which includes the reclamation of a certain area, the erection of quay walls, and jetties, very much on the lines of the Hunghom Bay scheme. (4) Captain Davison, the marine superintendent of the Canadian Pacific S. S. Company, and Captain Robinson, the commander of the R. M. S. *Empress of Australia*, put forward a scheme shortly after the typhoon of August 18, 1923, whereby a large wet dock should be constructed on the northern side of the harbor, from Kowloon point westward, enclosing the naval camber, and the wharves of the Hongkong and Kowloon Wharf and Godown Company. The chief object of this scheme was to provide an efficient typhoon shelter for deep-water ships where they could lie at wharves, and continue the loading and unloading of cargo.

The main object to be kept in view in the consideration of all these schemes was the provision of a close connection with the railway in order to reduce the handling of cargo to a minimum, with the provision of berthage for large vessels and junks at an early date. The principal advantage sought from the West Point scheme was the better control over the Chinese passenger traffic. Though it was realized that junks could land passengers anywhere, still the arrangements rendered possible by the proposed scheme would enable the police to carry out their search and inspection duties on the river steamers more thoroughly, and in this way an effective check would be placed on the arms traffic and piracy.

If the basic consideration of close railway connection with the proposed improvements was to be the deciding factor, the West Point and North Point schemes, being on the island of Hongkong itself, must give way to the Hunghom Bay scheme, close to which is the existing terminus of the Canton-Kowloon Railway. Putting the control of the Chinese passenger traffic aside, which only bears indirectly on the trade of the colony, the North Point scheme would appear to be next in value. It lies opposite Hunghom Bay, and, as the ground that would have to be acquired is undeveloped land, it could be obtained at a small cost.

Early this year all these schemes were considered by a committee of the Hongkong general chamber of commerce which gave as its opinion that the West Point scheme should take precedence over the others and when work was started on the Canton-Hankow railway it would be time enough to start the Hunghom scheme. The West Point scheme is estimated to cost \$2,000,000, exclusive



Plan of New Harbor Works for Macao

of wharfage, but nothing has been done by the colonial government to carry it out. The only progress made during the year was with the North Point scheme. A group of Chinese interested in the Java sugar trade, known as the Cheong Siong Land Investment Company, entered into a contract in July last with the Netherlands harbor works company for the construction of a quay at North Point to cost £400,000 which will provide 30 feet of water at low tide alongside the quay wall. Although the enterprise is entirely a private one the plans are approved by the government as part of the general harbor scheme and the work is being carried out under the direct control of the government's port engineer.

The much criticised procrastination on the part of the colonial government in definitely embarking on any expensive harbor development program would seemed to be explained by the continued turmoil in China which makes impossible that trade expansion which alone would justify such a heavy expenditure. The Canton harbor improvement scheme proposed by Major Olivecrona and sponsored by Dr. Sun Yat-sen and the Portuguese activities at Macao, while in no way endangering the supremacy of Hongkong as a deep-water port, must of a necessity have an important bearing on its general prosperity, and until economic conditions are once more stabilized in South China, and railway construction is resumed, it would seem that the colonial government's present policy is the wisest one.

A Deep Water Port for Canton

One of the most promising harbor improvement schemes in the Far East is embraced in the plans drawn up by Major G. W. Olivecrona (engineer-in-chief of the board of conservancy works of Kwangtung.) His proposed improvement of the front reach of the Pearl River between Shameen and the Whampoa barrier is the first comprehensive and practical scheme devised to carry out the cherished ideas of Dr. Sun Yat-sen to restore Canton's maritime prestige. Major Olivecrona brings this dream within the realm of practical finance by a careful estimate of costs amounting to Tls. 10,000,000, of which 75 per cent. will be covered by the proceeds from the sale of reclaimed land. The project calls for extensive dredging and rock cutting in the channel to a depth of 15 feet, reclamation, bunding and the construction of a bridge over the river to Honam.

The deepening and widening of the channel calls for the removal of some 171,500 cubic yards of rock and 504,000 cubic yards of sand, this material to be used in the reclamation work. The salient features of the scheme include the building of quays on the Canton side, 1.6 miles in extent and 1.38 miles on the Honam side having 15 feet depth alongside with space for a 65 feet wide roadway on the Canton side and 82 feet on the Honam side. All reclaimed land is to become public property. Several acres are provided for on the Canton side in which Dutch folly island will disappear as such and form part of the new reclamation. The next reclamation on the Canton side would take place on the stretch between the admiralty wharf and the Taishatau channel. A large piece of land would be gained on the outer edge of Kuper Island. On the Honam side, land would be reclaimed in front of the present customs club building, opposite to Dutch folly island, and to the harbor limits. In all 439,000 sq. metres (31,360 *chings*) of reclaimed land would be available. Only as much as will be needed for roadways and approaches to the bridge with their footpaths are reserved of the available land, the remaining areas to be sold in order to cover the costs for the improvements. The erection of warehouses along the roadway is to be left to private enterprise. The site for the proposed bridge is immediately above the up-stream end

of Dutch folly island. This bridge would have three spans; the centre one movable with a free opening of 147.6 feet and two stationary ones with an opening of 193.5 feet each. The movable would consist of two leaves or bascules, hinged near the faces of the central supporting piers and opening upward. When raised, a space of 147.5-ft. between the piers would be left unobstructed to a height of 51-ft. above high-water. On top of the piers a superstructure in the shape of a gate tower would be built, which would add to stability of the piers, and at the same time, add greatly to the appearance of the bridge. The stationary spans to be constructed of reinforced concrete, but the piers and abutments of concrete only, the latter faced with granite up to high water level. The movable span would be constructed of iron girders, and the machinery for its operation placed in chambers made for that purpose in the piers. When closed, the height of the centre span above high water would be 46 feet and that of the shore spans 35.1 feet. This space would permit craft of the same size as the present steamers running on the Macao route, to pass, and also medium sized junks, without opening the bascules. As heavy traffic is to be expected, the total width of the bridge between the railings would require to be 59 feet. Of this, 9.8 feet would be reserved on each side for footpaths, leaving a roadway 39.4 feet in width. The report suggests that the superstructure on the piers could be used as restaurants, the rental from which would help to defray the cost of operation and maintenance of the bridge. The sloping approaches on both sides of the bridge would each have a length of 763 feet. The under portion of the approach following immediately after the stationary span would have an arch 82 feet wide, allowing a passage for traffic along the waterfront and under the approach. The harbor construction is estimated to cost H. K. \$7,310,000 and the bridge H. K. \$2,360,000, a total of H.K. \$9,670,000. The sale of reclaimed land is estimated to bring in about H. K. \$7,164,000. This will cover 75 per cent. of the total cost. The report suggests that the remaining 25 per cent. should be borne by the public of Canton. Thus they would have to subscribe a sum of H. K. \$2,536,000. Of this amount \$2,360,000 would have to be spent on the Honam bridge. By carrying the work on by successive sections, and selling off the reclaimed land, sufficient working capital would always be at hand, assuming the public subscription of \$2,536,000 to have been paid up at the commencement of the work. The time that would

be taken to complete the whole scheme is estimated at five years. There seems to be no good reason why under normal conditions, the financing of this scheme should present any serious difficulties. Given an assurance of political stability in Canton, the funds to carry out this improvement might be readily raised in Hongkong. It is a safe proposition, brought within possible realization by the carefully worked out plans and estimates of Major Olivecrona.

Macao's Plans for Harbor Improvement

The Portuguese authorities are not standing by in idleness while Hongkong and Canton are perfecting plans for newer and better harbor facilities and have designed a \$12,000,000 scheme for Macao which is intended to restore to that port some measure of its former importance before the silt brought down by the Pearl River closed the roadstead to all but lighter draft vessels.

The works already undertaken are chiefly to assist the present traffic of the port which amounts to some \$27,000,000 yearly. These began three years ago with the yards and anchorages for native craft, a beach being prepared to serve as a cleaning place for junks, large efficient shelters for their use being established in a good position on the north of the peninsula. This enabled reclamation works to be undertaken with the material dredged from the harbor. Other improvements of a like nature are now being carried out at Taipa, where anchorages are being provided with a view to their use by the fishing junks. Altogether these minor improvements will cost \$1,500,000. In the inner harbor, some progress has been made in dredging operations, making possible the enlargement of the quays, but the main features of the scheme have yet to be realized.

During the last three years an exhaustive review of old plans initiated as far back as 1887 has been made, and the outcome of the comparison of these with modern conditions is a radical decision to construct an entirely new harbor at Macao. This plan, which it is proposed to carry out at once, is very comprehensive, but the potentialities of the port, regarded from the point of view of its possible conversion into a railway terminus for the rich and densely populated district of Heungshan, has now relegated it to the position of being only the central feature of a larger scheme which takes into account the possibilities of the port as a commercial outlet. The whole scheme for the construction of the new improvements and extensions has been placed with the Netherlands harbor works company, the firm which constructed the fine harbor of Chefoo. The estimated cost is placed at \$6,500,000 and the probable period of construction is three years.

The new harbor will be formed by two long moles enclosing the anchorage on the south and east, the area of dredging involved being 5,000,000 square metres, and the anchorage affording sufficient space for six steamers. The deep water channel leading into the entrance between the moles will have a length of 5,000 metres and a width of 100 metres. A sufficient depth in this channel will be maintained to allow steamers of a draft of 25 feet to enter the new harbor. The preliminary works in connection with the outer harbor have been commenced, with like improvements to those already in existence at Macao Siac, where are to be seen a shelter for small craft, completed reclamation works, and a large retaining wall in front of the area Preta. These works, however, are only a part of the vast scheme that is being considered for the port.

Unique Use for Culverts

ONE is constantly running across some striking example of the important part played by the manufactured product in the advance of civilization.

In the wilds of Nairobi a hunter, a short time ago, found himself in a perilous condition. Missing his shots at an enraged lion, he found nothing left to do but to run for his life with, apparently, no hope of escaping. What was his surprise, when despair had practically seized him, to stumble against a corrugated culvert lying in a gully awaiting placement. He did not stop to wonder how this highly specialized product found its way to those inaccessible wilds, so far removed from the white man's domain, but with the last expiring vestige of strength, wriggled his way inside. The enraged lion, prevented from forcing his way within, endeavored,

in his rage, to tear the culvert apart. But the culvert, manufactured to withstand far greater and more incessant forces than those of lions, remained immune to his fury and the savage beast was, at last, compelled to retreat without his victim.

This incident illustrates the great advance that has been made by the American manufacturer in so fabricating his goods as to provide for their transportation under the most unfavorable conditions. Undoubtedly this corrugated culvert was of the nestable type, fabricated in sections, in such a manner, that these sections could be nested together so as to occupy very small space and allowing of transportation in almost any manner and by almost any means.

There is a firm in Canton, Ohio, U. S. A., The Berger Manufacturing Co., that manufactures these nestable culverts in such a way that very frequently they are carried as ballast on ships and are accepted by steamship companies, for export, on a weight basis as against cubic measurement basis. This allows these culverts to be shipped and transported practically everywhere,—on backs of camels, packed on mules and lamas and, in numerous countries, upon the backs of native carriers, thus permitting them to be installed in places where no other type of culvert could even be delivered. Below is shown a picture of such transportation.

There is told an interesting example of this in the building of the Madeira and Marmore railroad in Brazil. This road, at the time the tale was told, was the only way in which crude rubber could be carried to the coast. Every year thousands of dollars worth of this rubber was lost in the rapids of the Madeira River. After many experiments sixteen carloads of the nestable culverts, spoken of above, were transported through almost trackless jungles on the backs of natives to take the place of bridges on this railroad, it being found impossible to deliver structural iron there. In this way, it is claimed, millions of dollars worth of crude rubber was saved.

Another thing which has made these nestable culverts practicable in almost inaccessible places is their long life. The American manufacturer in his development of corrugated culverts now employs a rust and corrosion-resisting metal. This is accomplished by so adding copper to pure iron that it thoroughly mixes with it, very much as blueing mixes with soft water. In this way, the copper actually becomes a part of the iron, producing a pure copper alloy. This method of manufacture results in the formation of metal culverts so thoroughly rust-resisting that they enjoy an exceedingly long life even under the most unfavorable conditions.

The third advantage regarding these types of culverts is that they are not affected by freezing or thawing. This means that in whatever climate they are used, if properly installed, they will not break or crush. In addition to this, rough handling does not, in reality, affect them since, being elastic and flexible, they are able to withstand shocks and vibrations which would prove disastrous to more rigid types and, in this way, are sure to arrive at their destination without being cracked, chipped or broken.



Huge Shale Oil Distillation Plant for Fushun

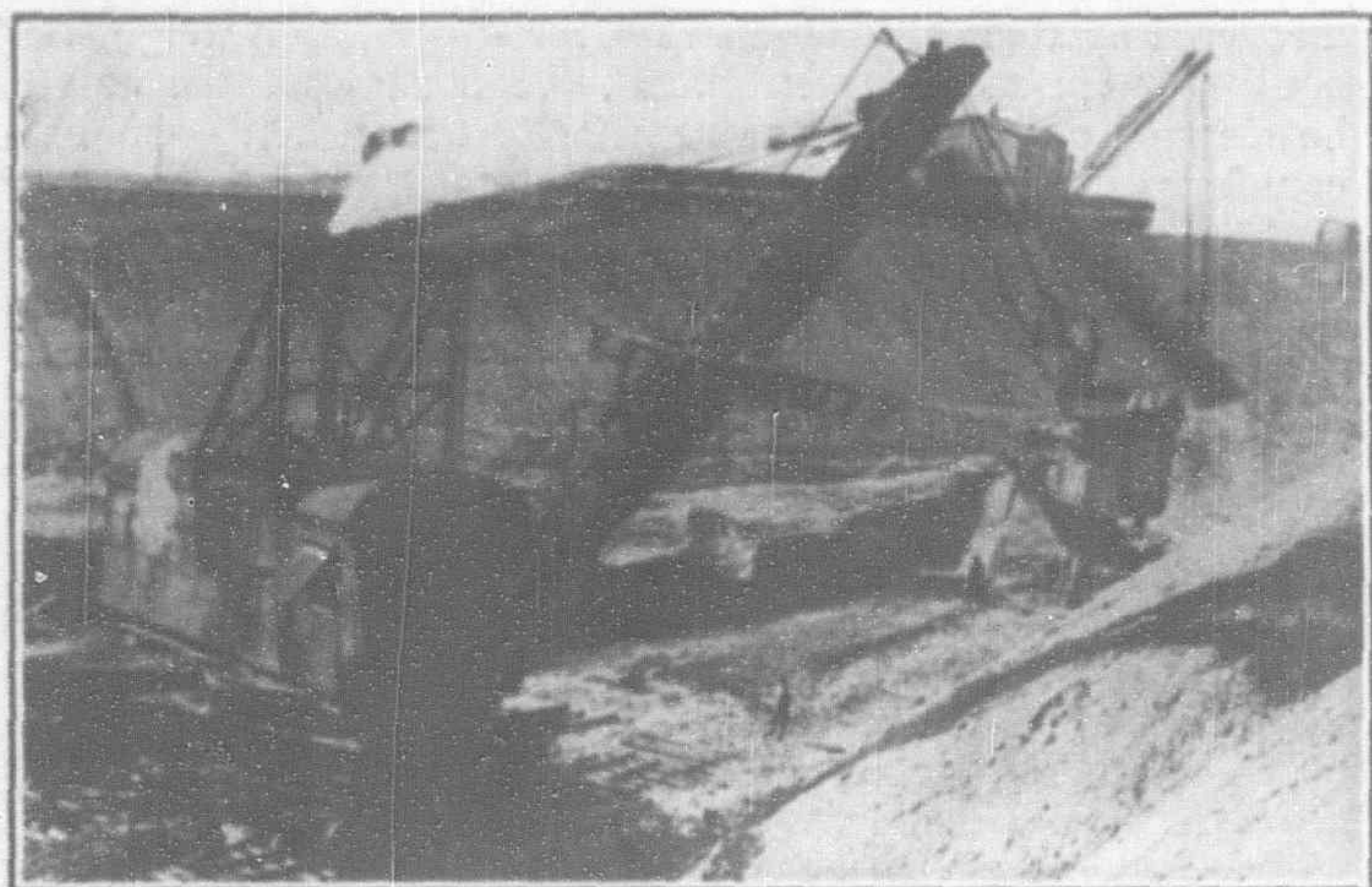
(Continued from page 477)

while she has been extending her control over new foreign deposits, the entire nation has stood solidly behind its government. There is little doubt that when the Japanese people understand the vital necessity of controlling similar oil supplies in territories which they hold in lease, they also will come together in support of an undertaking which promises them relief from foreign importations.

Although the Scotch report places the oil percentage 10 per cent. lower than originally expected by the Railway Company and the returns of sulphate of ammonia, a by-product, are quite discouraging, these somewhat unsatisfactory returns are discounted by Rear-Admiral T. Makino, now in the service of the S.M.R. Co., in charge of the new oil shale industry. He commented on the report from Scotland in substance as follows:

"In the first place the transportation of shale over so great distances has reduced it in size far below 2 inches in diameter which is accepted as the right size for distillation purposes. Moisture was absorbed and it was subjected to great heat in the ship's hold while under transit through the tropics. Owing to the reduction in size, the pieces of shale have become more susceptible to weathering action.

"The report admitted that better returns may be obtained, if experimented upon at the place where the shale has been mined.



Bucyrus steam shovel and excavator in open cut work at Fushun

The effect of weathering action had been expected by the railway officials and while the above returns cannot be taken for granted as applicable to all cases, if the interest on the fixed capital, and depreciation for buildings, machinery, etc., not to mention a suitable margin of profit, as in the case of a general business corporation, were to be taken into reckoning, the oil shale industry could hardly be said to have big prospects as a paying venture. It would seem, however, that the contemplated investment will be justified by the returns. This is especially so, since the Scotch experiments found the cost of production to be very much lower than had been calculated by the railway officials."

Mr. M. Umeno, director of the S.M.R. Co., has stated that the question now is whether the shale distilling plant can be commenced on as large a scale as desired by the navy. The navy expects the new experimental factory to be capable of turning out 50,000 tons of shale oil a year, and has proposed to take the whole output at such a price as to cause no loss to the railway company.

"By our own experiments, he said, "the profit on this new enterprise was made out to be 35 per cent. According to the first report from Scotland, the profit margin is put at 15 per cent., which will make the scheme quite possible if the contract with the navy runs for 20 years or longer."

The oil shale at Fushun lies over the immense coal seam and is about 4,000-ft. in thickness containing roughly 5,500,000,000 tons. The oil percentage varies from 10 per cent. to 4 per cent. with the average of 5.5 per cent. The oil is extracted by dry distillation. The total oil obtainable will be 300,000,000 tons, or one-fifth of the total petroleum reserve of the United States. Figuring the total annual consumption of Japan, including what is

for naval use, at 1,500,000 tons, the Fushun shale oil may supply the annual wants for 200 years.

The oil shale, that the S.M.R. Co. is planning to work in the open cut zone, amounts to about 500,000,000 tons, from which 2,300,000 *koku* of heavy oil will be obtainable by dry distillation.

Big Supply

The oil shale reserve, if divided according to the different pits, will be as follow:

| | |
|----------------------|---------------|
| Open cut | 538,843,981 |
| Oyama shaft | 712,546,952 |
| Togo shaft | 387,698,753 |
| Laohutai pit | 601,787,329 |
| Wantawu pit | 726,689,171 |
| Hsintun pit | 1,108,430,492 |
| Lungfeng pit | 1,023,665,734 |
| Talien pit | 377,603,005 |

Total 5,477,265,417

The estimated reserve according to the depths from the surface ground is: Down to 100-ft. deep from the surface ground, 252,000,000 tons; down to 200-ft., 505,000,000 tons; down to 300-ft. 756,000,000 tons; down to 500-ft. 1,223,000,000 tons; down to 1,000-ft. 2,380,000,000 tons; down to 2,000-ft. 3,415,000,000 tons; down to 3,000-ft. 4,932,000,000 tons and down to 4,500-ft. 5,477,000,000 tons.

Fushun oil shale, in spite of its small oil percentage, possesses economically workable value, owing to the following reasons: Its existence in a very thick stratum overlapping the coal seam at accessible depths from the surface ground; availability of cheap labor; abundance of coal for fuel obtainable at a modest price; ample communications and plenty of water for industrial use.

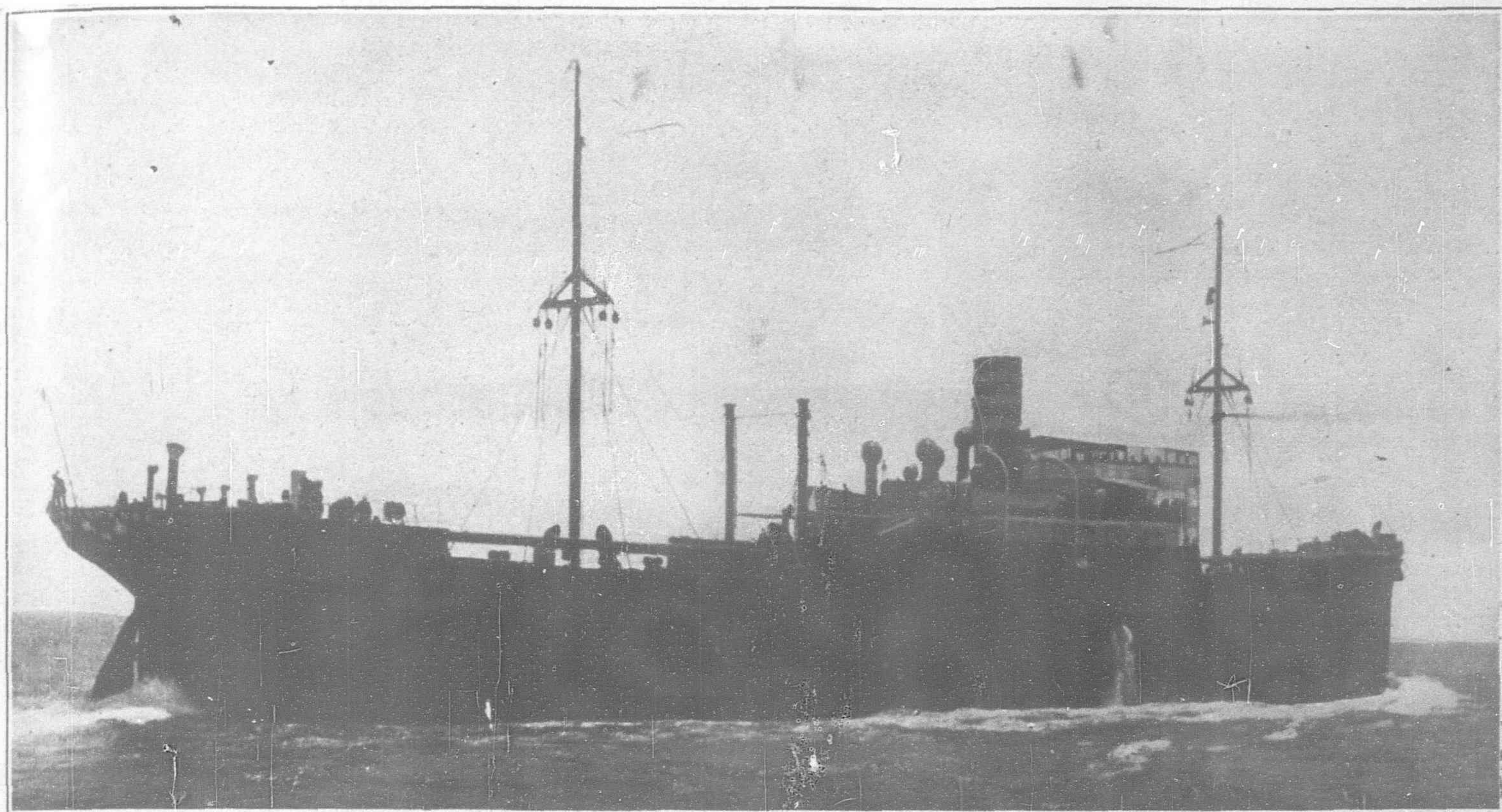
How far this immense shale reserve can be mined awaits fuller study, and the problem must be solved by taking into account the demand for petroleum and the cost of production. In case of these two conditions being favorably met, the exploitation of 2,000,000,000 tons of oil shale is not considered difficult from a technical standpoint.

The New Ambassadors

THE selection of a proper successor to Mr. Hanihara has had the most careful attention from the Tokyo government and from a list of names including Baron Matsui, Viscount Ishii, Ambassador Hioki and Mr. Tanaka, all able diplomats of ambassadorial rank, the choice has fallen on Baron Matsui, the predecessor of Baron Shidehara in the foreign office. Scholarly, dignified, conservative, polished to a high degree, with a personal charm that invites friendship and confidence, added to a profound knowledge of international law, Baron Matsui is eminently qualified to represent his country at Washington and carry through the delicate negotiations interrupted by the resignation of his predecessor. Both Japan and America are to be congratulated on the appointment.

In the same spirit that moved the Japanese government to select its best available diplomat for the Washington post, President Coolidge has exercised unusual care in picking the proper successor to Cyrus E. Woods. In naming Edgar Addison Bancroft as ambassador to Japan, the president has acted as wisely as was possible under our antiquated system of selecting a man for such a major diplomatic post. Such appointments whenever possible should be made from the best equipped men in the diplomatic service but as it is as yet too early to place our new system into practice, the president has been forced to seek a man with special fitness for such a task. Mr. Bancroft admirably fills the requirements. He is a lawyer of national reputation, scholarly and cultivated with broad sympathies and high principles.

His special recommendation for the post is that he will be fair and judicial and meet each question as it arises with an open mind. It is all that both nations can reasonably hope for at this particular juncture, and the fact that Mr. Bancroft has the advantage of starting his diplomatic career with a clean slate free from previous experience and prejudices, will make him freer to do what he believes ought to be done. On this basis, the Japanese extend the glad hand of welcome to the new American ambassador and stand prepared to meet him in the same open and frank spirit which has always characterized their friendship for America.



7,000-Ton Motorship *Akigisan Maru* built by the Ship Building Department of the Mitsui Bussan Kaisha at the Mitsui Dock and Shipbuilding Yards located at Tama, Okayama, Japan

Japan Building Motor Ships

The Mitsui Shipbuilding Yards Completes First Large Motor Vessel Built in Japan

THE popularity of the motor drive in the European shipping industry has spread to Japan where great interest is now being shown in this type of ship propulsion. The general results of this type of vessel in Europe has been very satisfactory, the figures of fuel consumption in most cases being remarkably low. As a result of the more economical operation of the motor ship, the development of new types and the changing of turbine and expanded engine vessels to motor drive promises to be one of the brightest outlooks for the European shipbuilding industry. Japanese shipbuilders are following this development with great interest seeing in it the possibility for a revival of their own industry while shipowners are equally interested in the operating reports which show that motor vessels earn considerably higher returns on the invested capital than steam vessels.

Setting the example to other Japanese shipping firms, the N. Y. K. last year ordered two motor ships (the *Atago Maru* and *Asuka Maru*) from Clyde shipbuilders, the contract for the first mentioned being placed with Lithgow's Ltd. These vessels are of 10,000 tons deadweight capacity with a gross tonnage of 7,500. Their length between perpendiculars is 440-ft., 57-ft., moulded breadth and 38-ft. 6-in. moulded depth. There are six cargo holds, one of which is a deep tank, with six cargo hatches and twenty derricks. The member and capacity of these derricks are as follows: Six 10 tons, Six 6 tons, six 3 tons, one 40 tons and one 20 tons. The deck machinery consists of 19 horizontal electric winches and one electrically driven windlass. The steering engine operates a Hele-shaw Martineau steering gear with telemotor gear complete.

Both vessels have a shelter deck with top gallant forecastle and two continuous decks. The *Atago Maru* launched at Lithgow's yard is engined with two sets of two-cycle single-acting 4-cylinder Sulzer (680 m.m. bore and 1,200 m.m. stroke) Diesel engines. These are of the standard Sulzer construction with separate electrically driven turbo-blowers with the central station for the two motors

arranged at the level of the top grating as is customary with the majority of Sulzer equipped vessels. The *Asaka Maru* built by Henderson's is equipped with two sets of four-cycle single-acting 8-cylinder Burmeister & Wain engines. The engines for both vessels are designed to give 4,000 b.h.p. at 100 r.p.m. which gave 15 knots speed on the official trial trips.

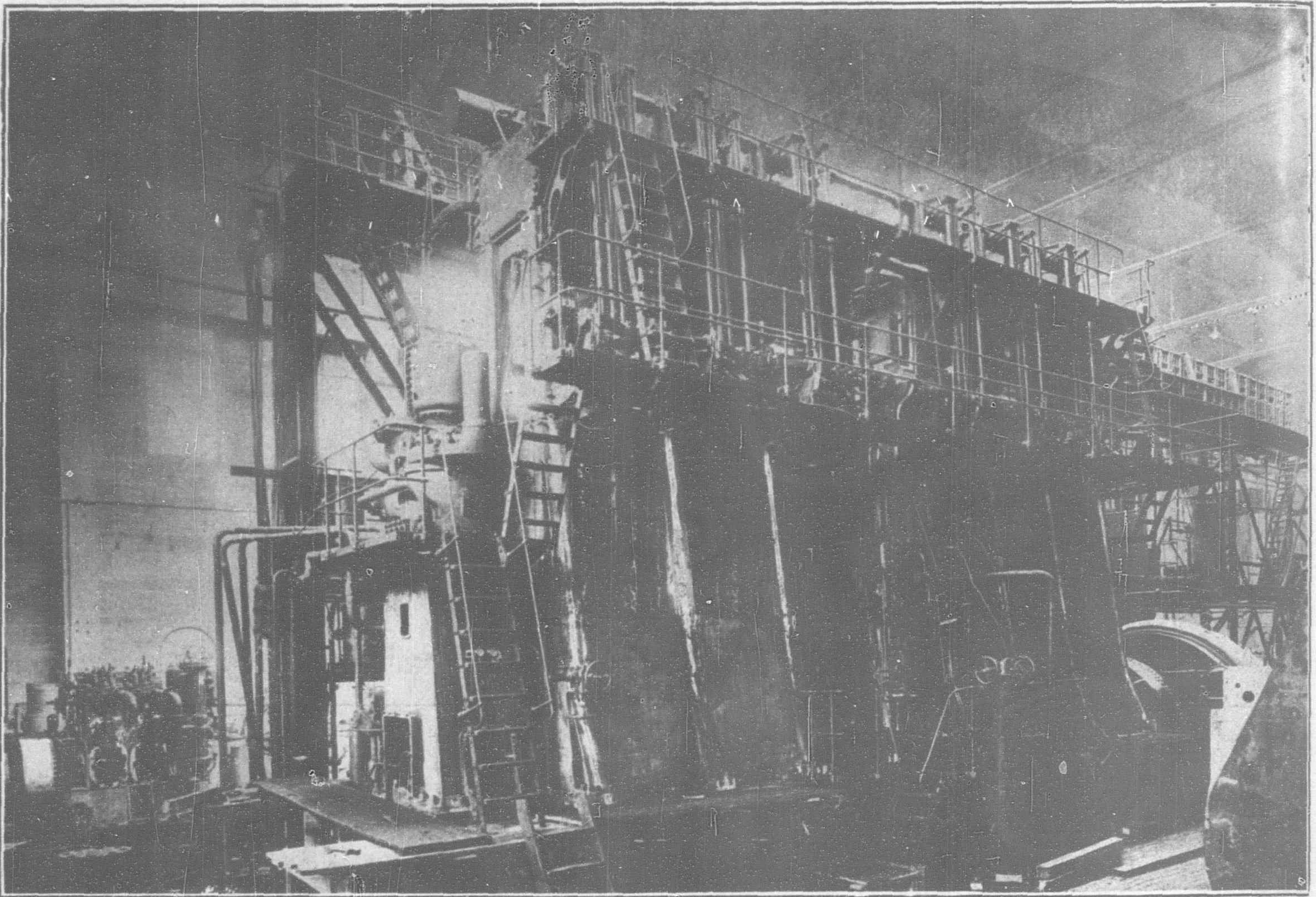
These two sister ships from different builders and equipped with different makes of engines were ordered by the N. Y. K. to obtain comparisons of their performances in actual service.

In the meantime the great Mitsui interests started work on a new motor vessel in their own shipbuilding yards at Tama near Okayama in Japan. These works, operated as the shipbuilding department of the Mitsui Bussan Kaisha were established at the height of the war boom in 1917 and have turned out many excellent ships for the company's fleet and private owners. The yard has two dry docks and several building berths. Their first motor ship, the *Akagisan Maru*, was an unqualified success, exceeding its designed speed by more than a knot. The vessel, attached to the Mitsui fleet on the American run, started on its maiden voyage from Kobe late in July, and has shown itself to be economical in fuel consumption, surpassing the most sanguine expectations of its designers and constructors.

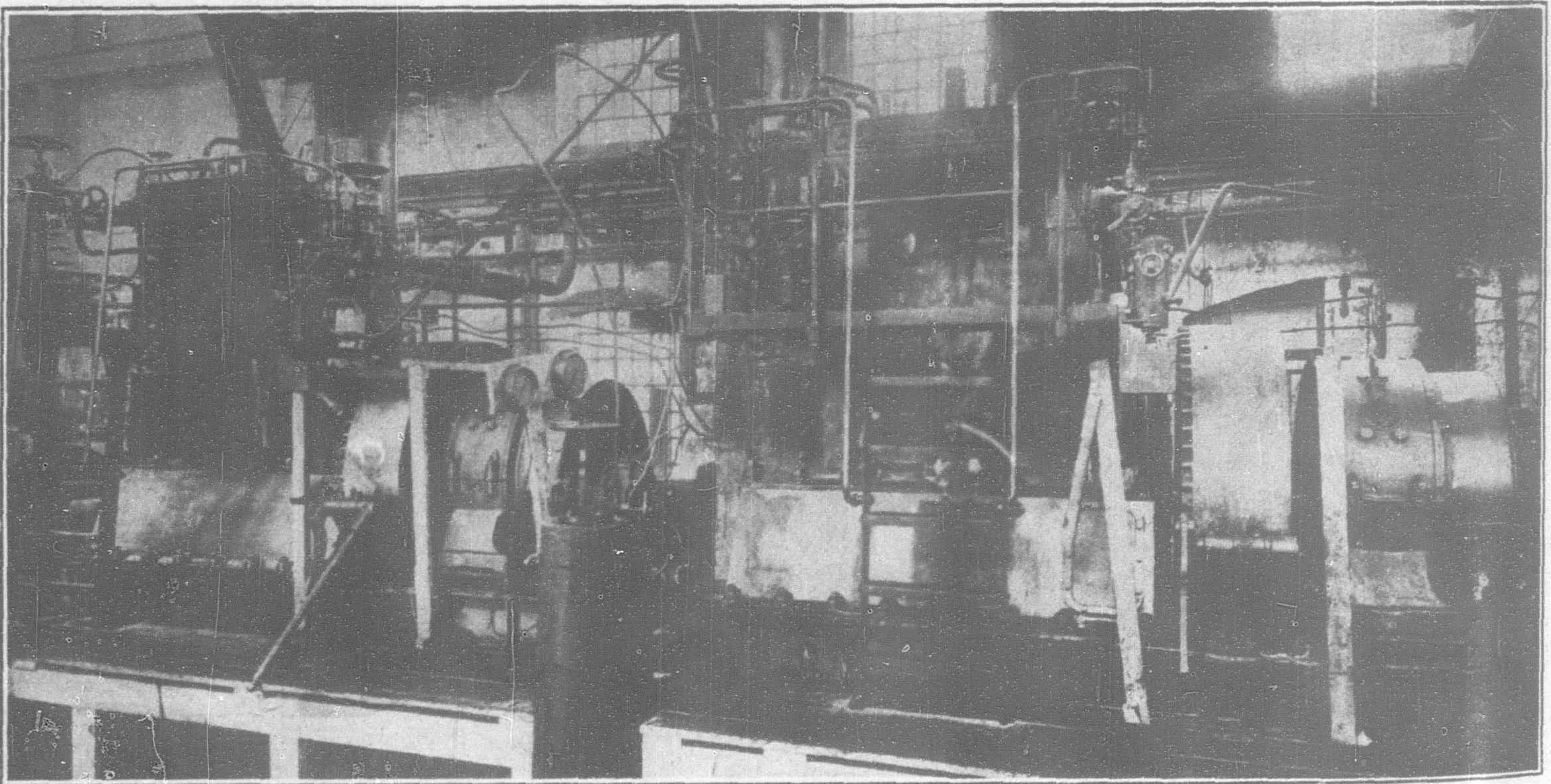
The *Akagisan Maru*, the first large motor ship to be built in Japan, was designed and constructed at the Mitsui yard at Tama under a special Lloyd's survey. It is classed as 100 A1 at Lloyd's and also complies with all the requirements of the Japanese laws.

The principal dimensions of the vessel are: length overall, 389-ft.; length, between perpendiculars, 375-ft.; breadth, moulded, 50-ft.; depth, moulded to upper deck, 30-ft.; depth, of double bottom, 3-ft. 5½-in.; draft, loaded about, 24-ft. 4-in.; gross tonnage, about, 4,630 tons; deadweight, about, 7,000 tons; designed speed, 10.75 knots; fuel consumption per day, about, 7½ tons; b.h.p., 1,800.

The vessel has two complete steel decks, and six water-tight bulkheads. The double bottom is arranged for the carriage of



Main Motor for the *Akigisan Maru* erected in the shops of Burmeister & Wain, Ltd., at Copenhagen, Denmark



Auxiliary Motors for the *Akigisan Maru* in the shops of Burmeister & Wain, Ltd.

oil fuel or water ballast. The total water ballast capacity of the vessel is 970 tons including both peaks, and the oil fuel capacity 720 tons. The five cargo holds have a total grain capacity of 320,000 cubic feet. Each hold except No. 2 has a hatch 24-ft. 9-in. by 18-ft. 0-in. The hatch for No. 2 hold is 30-ft. 3-in. by 18-ft. 0-in. and

that for bridge space is 19-ft. 3-in. by 15-ft. 6-in. The cargo handling appliances consist of eight 5-ton derricks which are served by eight 3-ton winches, two 1½ ton on the bridge deck and one 5 tons which is fitted with extension warping barrels. The winches are all electrically driven and were supplied by Laurence Scott & Co.

The steering gear, which was supplied by John Hastie & Co., is of the electric hydraulic type, and is controlled from the bridge by the telemotor. A powerful windlass, which was supplied by Clark Chapman & Co., also is electrically driven. The motor is located under the deck.

In the forward bridge erection, accommodation is provided for captain, deck officers, wireless cabin, chart room, saloon, and steward room. In the deck house round the casing is ample accommodation for the engineers, mess room, and galley. The crew spaces are accommodated forward of the bridge. Electric radiators have been fitted for heating the quarters of both officers and men.

The propelling machinery consists of one six-cylinder, four-cycle single-acting, long-stroke Diesel engine of Burmeister & Wain make, normally rated to develop 2,350 i.h.p. at 87 revolutions per minute (corresponding 1,800 b.h.p.) The daily fuel oil consumption is from 7 to 7½ tons, giving the vessel a cruising radius of about 30,000 miles.

All the auxiliary machinery in the engine room, as well as deck machinery, is electrically driven, current being supplied by the

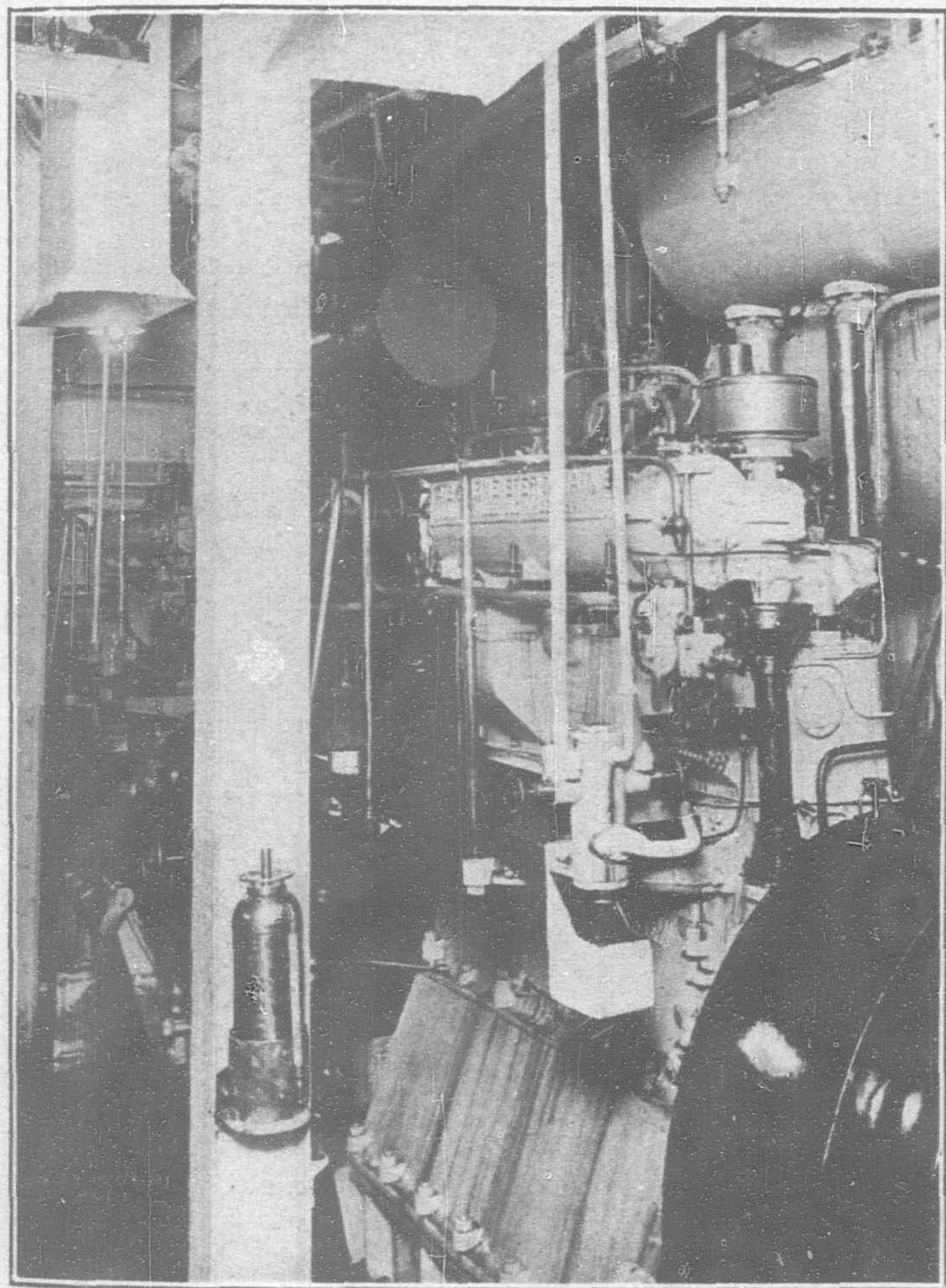
engines were turning at slightly over their rated revolutions. Many influential representatives of shipping and ship building firms were present on the trial trip, as this is the first ocean-going motor ship to be built in Japan. Results obtained during sea trials were:

Oil: Tarakhan Blue Anchor, specific gravity 0.935; revolution per minute, 94; speed of ship, 12 knots; pressures-air in l.p. compressor, 1.05 kg./cm.2; air in m.p. compressor, 9.49 kg./cm.2; air in h.p. compressor, 60.62 kg./cm.2; starting air receivers, 25.85 kg./cm.2; circulating water, 1.69 kg./cm.2; lubricating oil, 1.25 kg./cm.2; air bottles, 60 kg./cm.2;

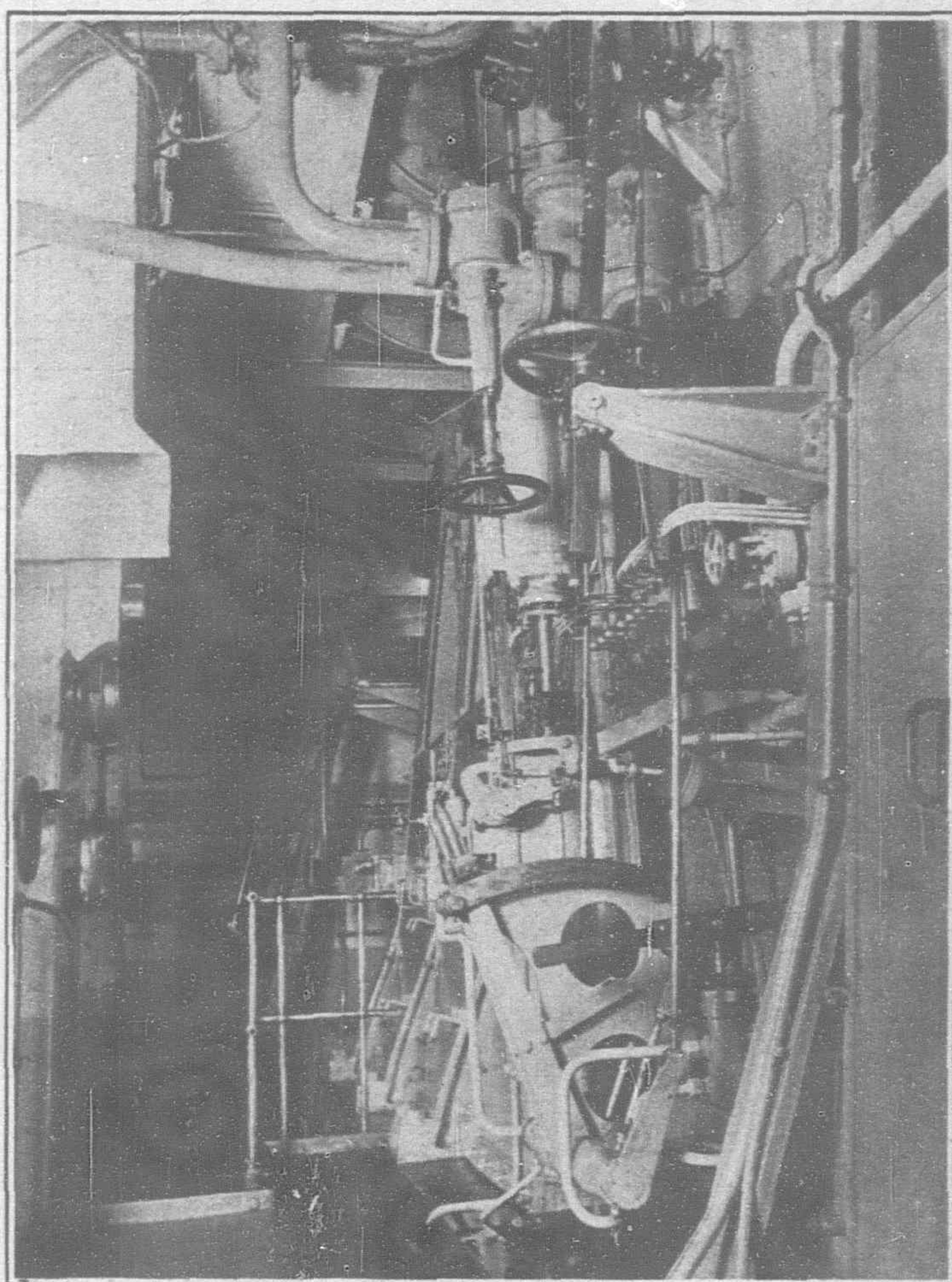
Atmospheric temperature, 27° C.; engine room, 28° C.; sea water, 24° C.; sea water discharge, 53° C.; cooling water in cylinder cover, 46° C.; cooling water in piston, 44° C.; cooling water in exhaust pipe, 53° C.

Lubricating oil temperature at inlet, 29° C.; lubricating oil at outlet, 34° C.; fuel oil in settling tank, 30° C.; exhaust gas at cylinder, 317° C.

Total i.h.p., 2,400; oil consumption per i.h.p. per hour including the fuel oil required for the auxiliary engines, 0.131 kg.



Auxiliary Motor installed in the *Akigisan Maru*



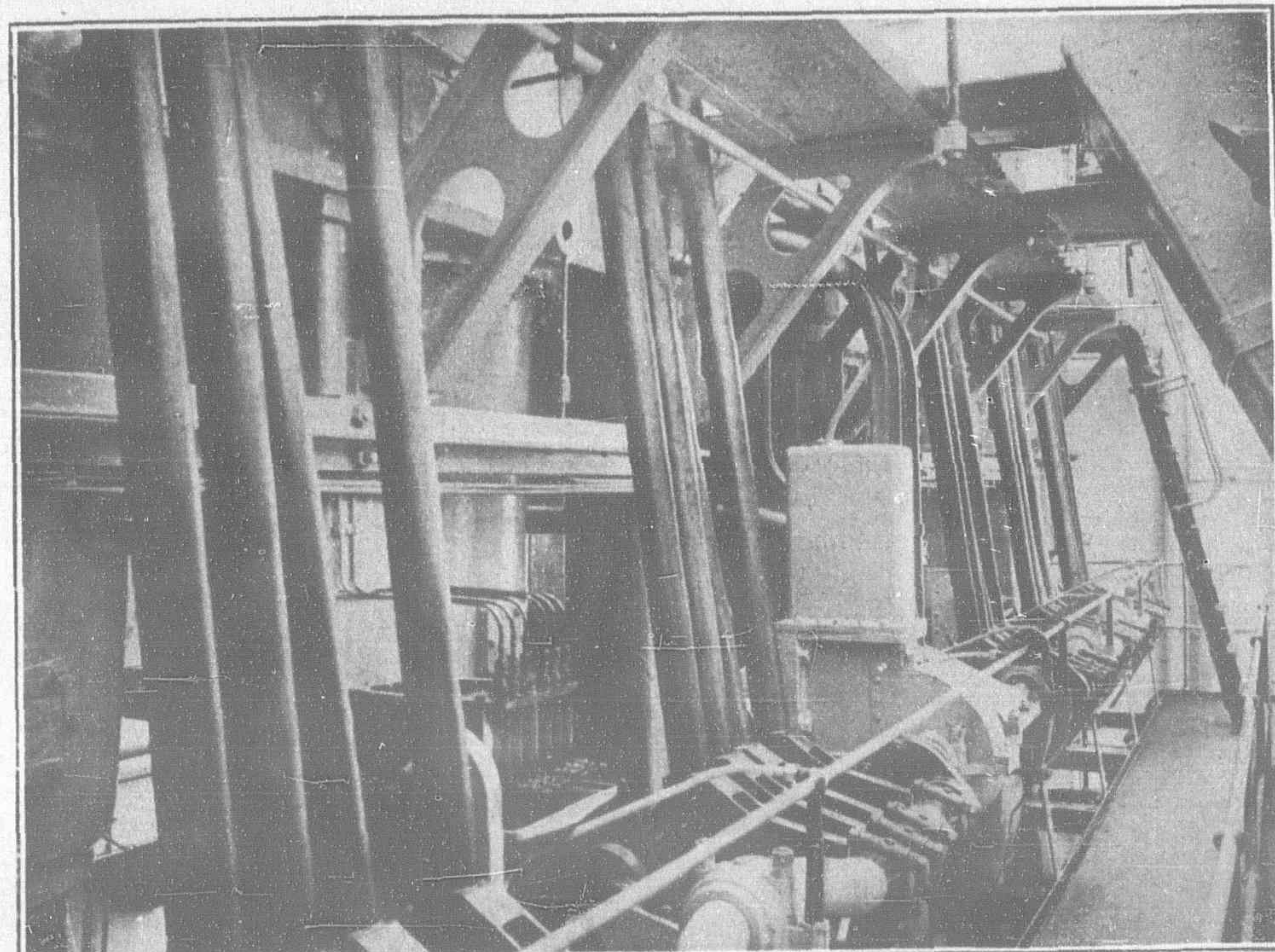
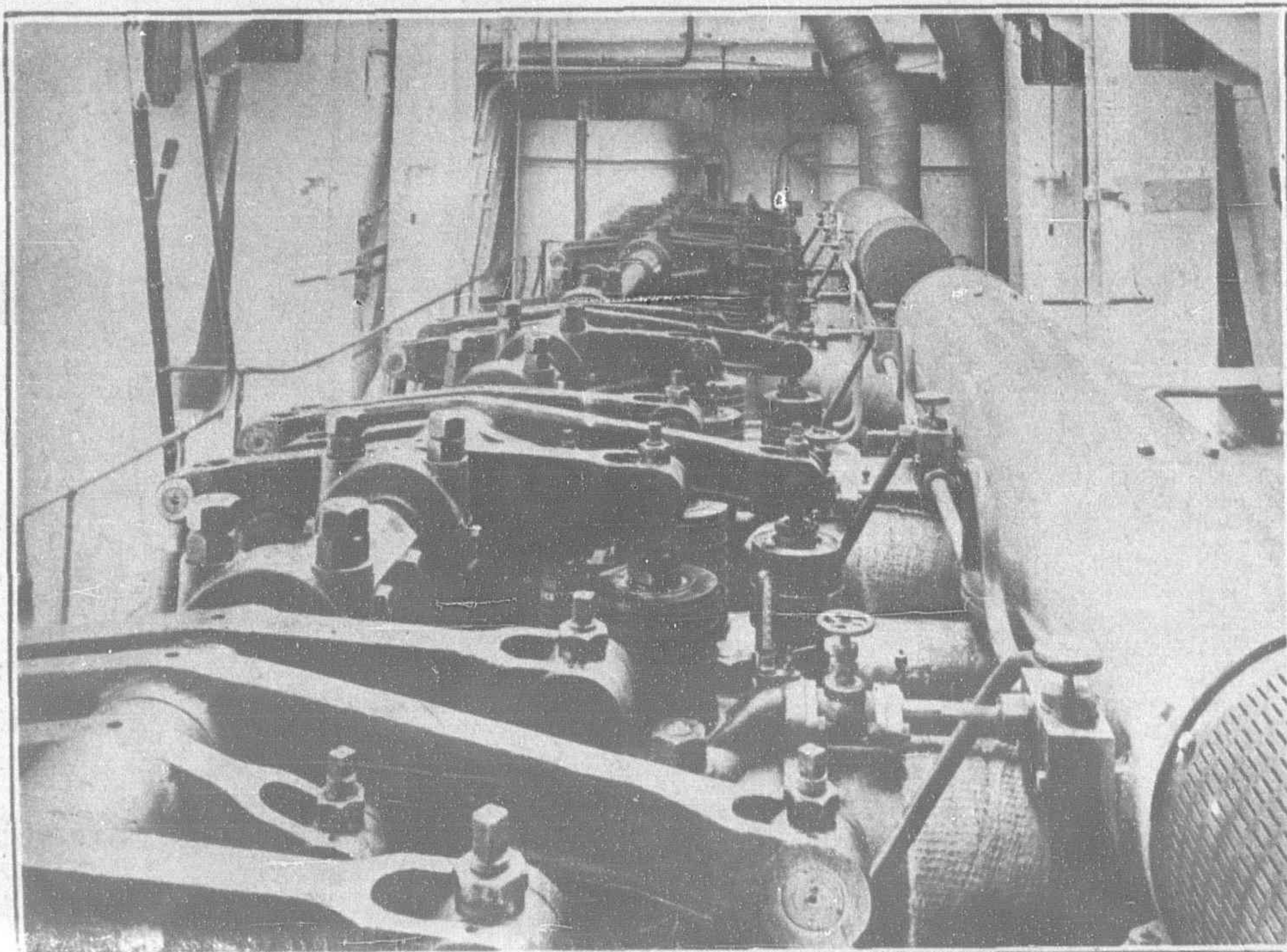
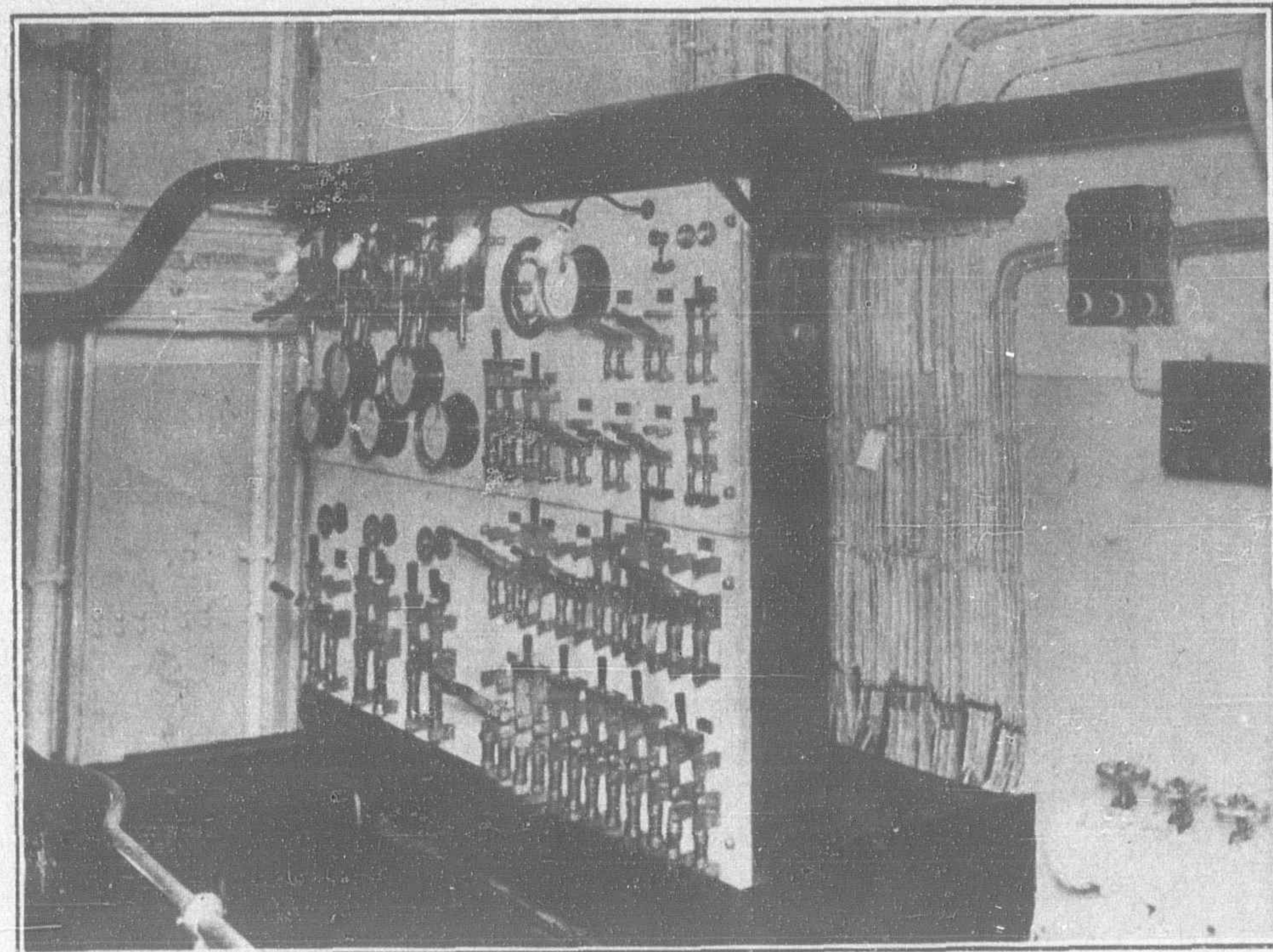
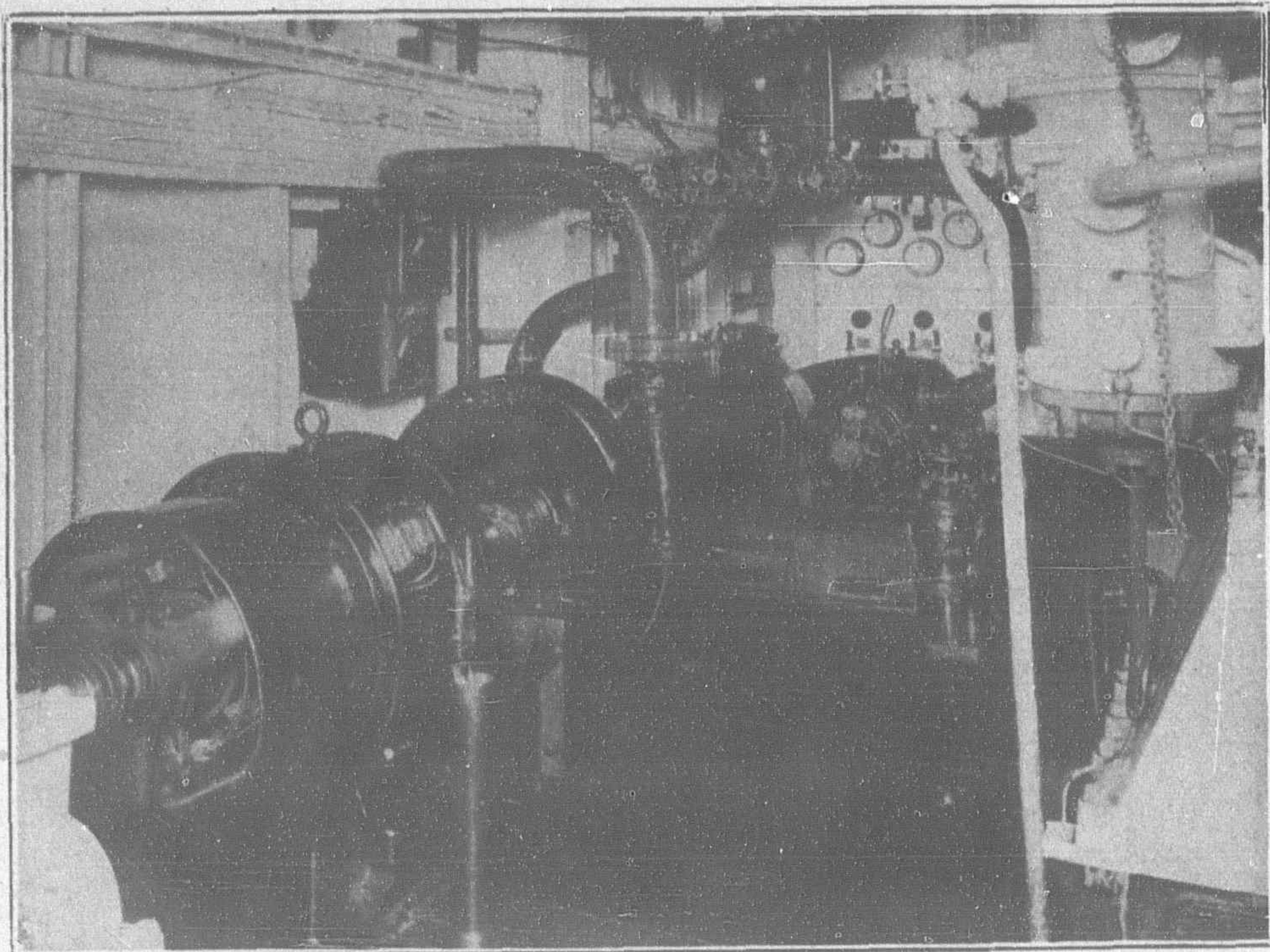
Starting Platform *Akigisan Maru*

auxiliary Diesel engines of 75 b.h.p. direct connected with air compressors and 50 k.w. generators. There are several pumps, one combined lubricating and daily supply pump, one combined forced lubricating and circulating water pump, one ballast water pump, and bilge, sanitary and cooling water pumps. One donkey boiler, which is fitted with an oil burner, is to be used for leveling work in holds and for the oil fuel in the double bottom. Any one of the dynamos is sufficient to supply the necessary current required for normal working at sea, but two or even all three have to be in operation when the vessel is manœuvring in and out of harbor with the manœuvring compressor, running or when loading and discharging cargo.

The trials of the *Akigisan Maru* were carried out on July 14, on the picturesque inland sea, in the vicinity of the Tama yard. Full speed, reversing, manœuvring and turning circle trials were successfully accomplished. The exhaust from the engines is discharged into a silencer in the funnel, and the complete absence of any sign of the exhaust gas is worthy of note—even when the

This first motor vessel to be built at a Japanese yard will be followed shortly by the launch of two 9,700-ton deadweight motor ships at the Kawasaki Dockyard at Kobe to the order of the Kawasaki Steamship Company. The first of these vessels, now nearing completion, is 405-ft. in length b.p., with a beam of 53-ft. and a depth of 37-ft., and engined with a Camellaird-Fullagar type engine, constructed by John Brown & Co. It is a six-cylinder set, with cylinders 22 inches in diameter, the stroke of each piston being 33-in. The output is 2,500 b.h.p., with a speed of 98 r.p.m., while the normal speed of the ship will be in the neighborhood of 11 knots.

These two motor vessels for the Kawasaki Steamship Company are to be followed by two more for the same company to be added to the motor ship fleet of the Roosevelt Steamship Company, an enterprise organized last year between the American company and the Matsukata interests in Japan. Under the new arrangement the Roosevelt Steamship Company was to contribute five new motor vessels built in British yards and the Japanese four similar vessels to be built in Japan at the Kawasaki yards. The



MOTOR SHIP AKIGISAN MARU

Top: Combined Lubricating Oil and Cooling Pump and Ballast Pump
Bottom: Top of Cylinders

Top: Switchboard
Bottom: Cam Shaft of Main Engine

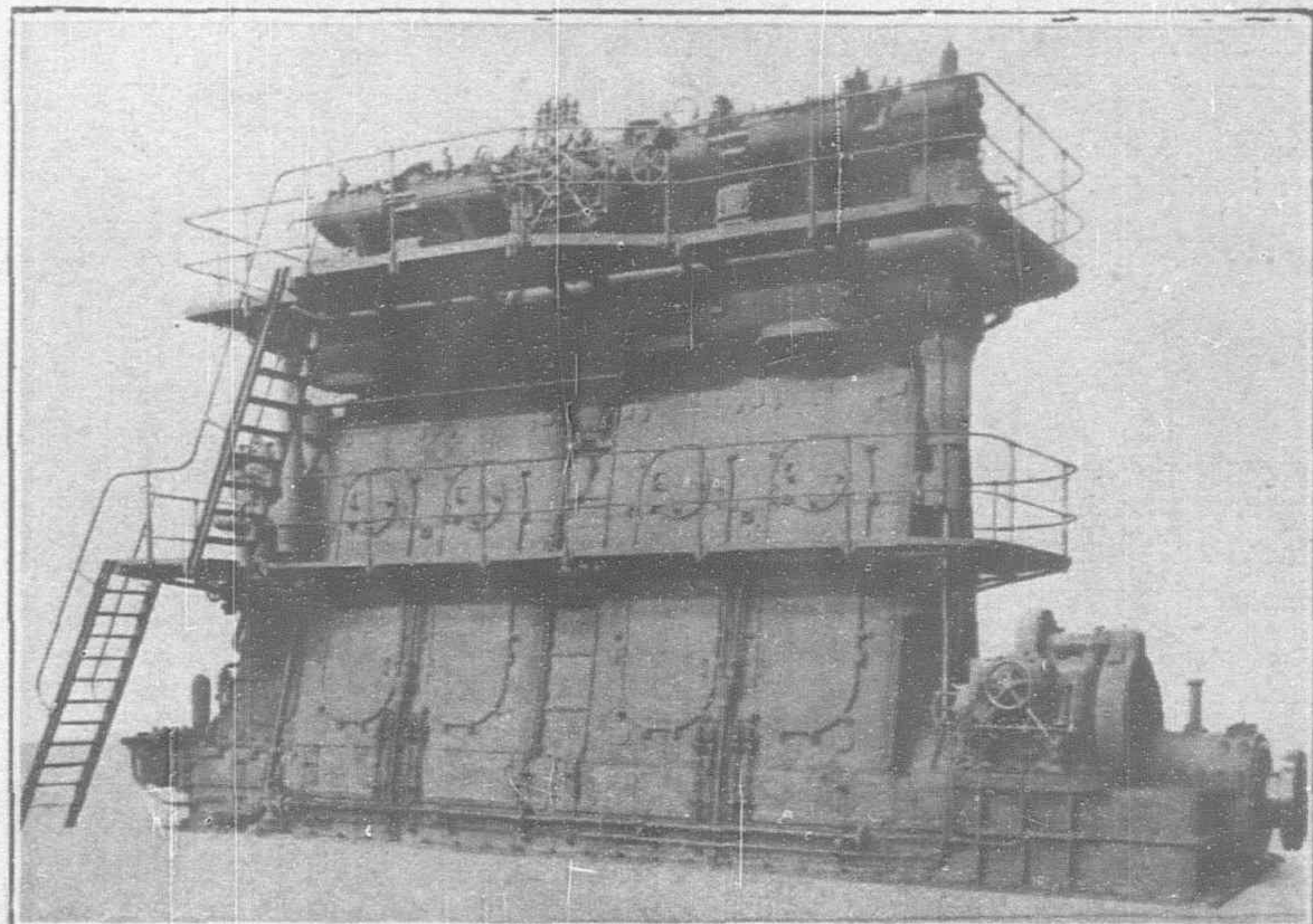
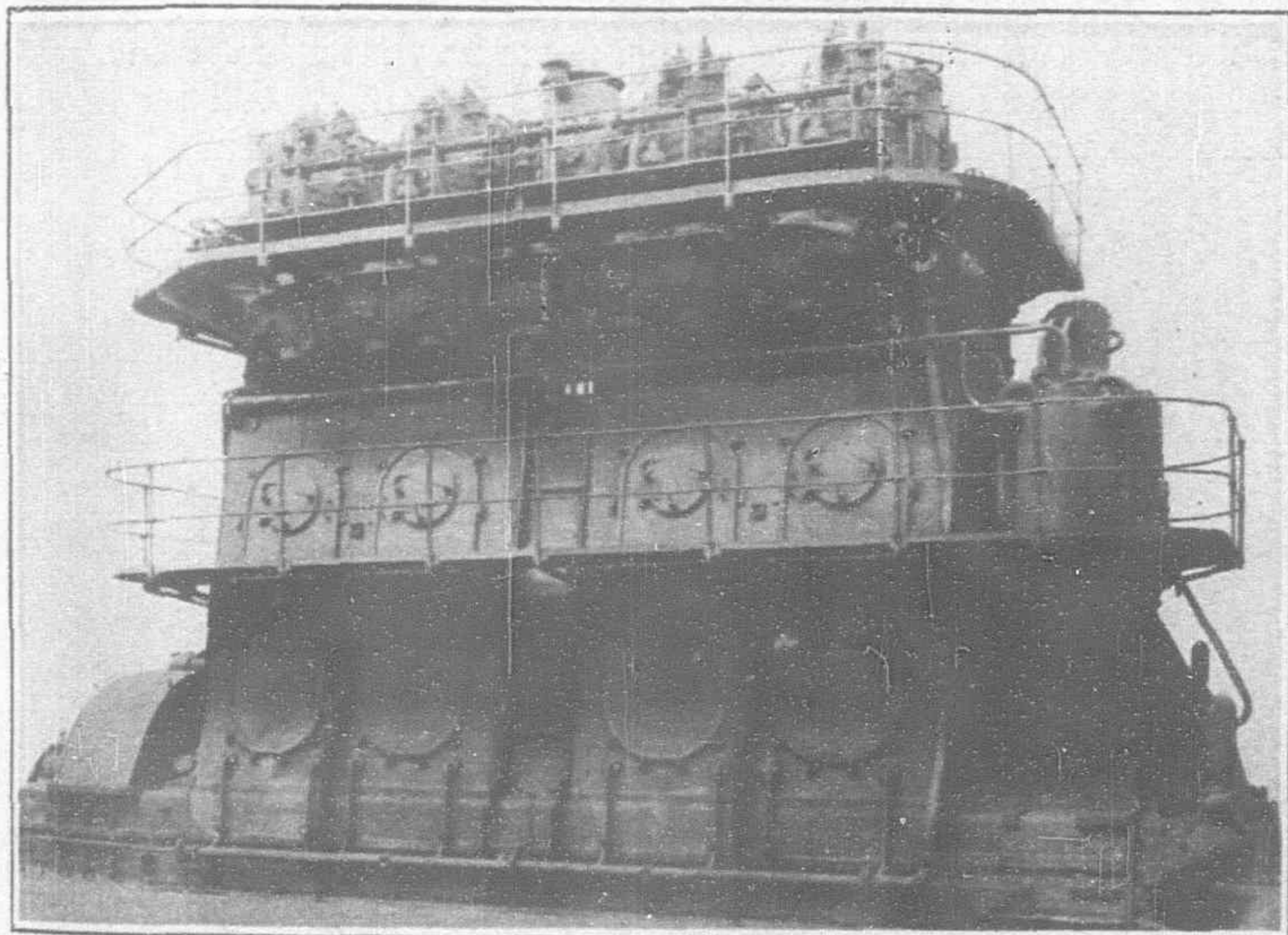
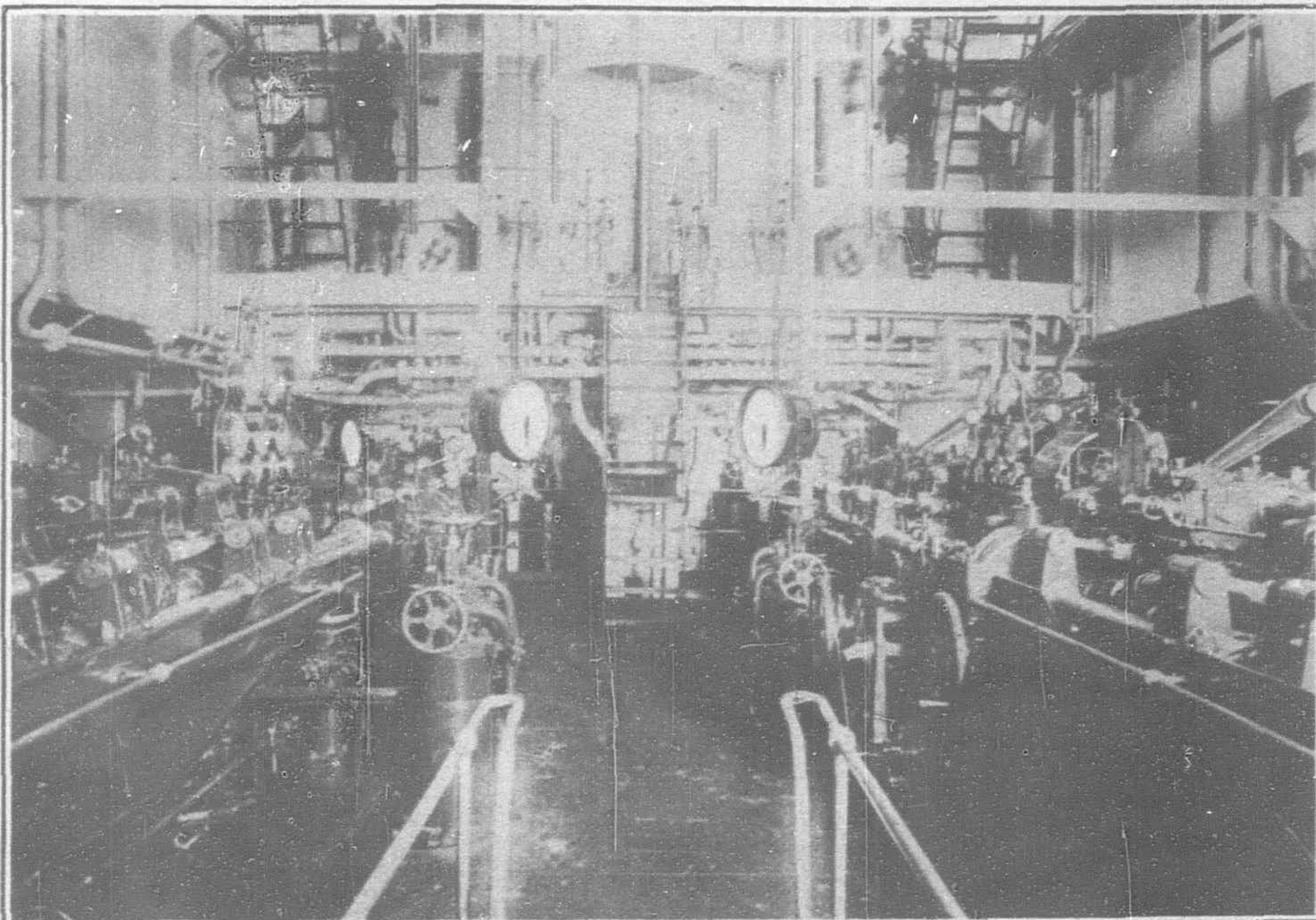
first of these new vessels was dispatched on her maiden voyage from London to the Far East via the Panama Canal in July last.

The British motor ships for the Roosevelt-Matsukata fleet are called the *Silver Elm*, *Silver Cedar*, *Silver Fir*, *Silver Pine* and *Silver Larch* all of 8,000 tons deadweight. The first three were built at Doxford's yard in England and equipped with Doxford engines. The two last vessels are of 8,500 tons deadweight fitted with the Neptune engine and are being built by Swan, Hunter and William Richardson, Ltd.

An outstanding feature of these motor ships is their very large cubic capacity, which consists of 535,000 cubic feet bale space. The guaranteed speed is $10\frac{1}{2}$ knots, and the consumption is about $8\frac{1}{2}$ tons of oil for the main engines,

decision to change the fleet over to motor ships was based on a cut-and-dried-business arrangement. It was found that the steamships were running on the dearest coal bunkering route in the world. At

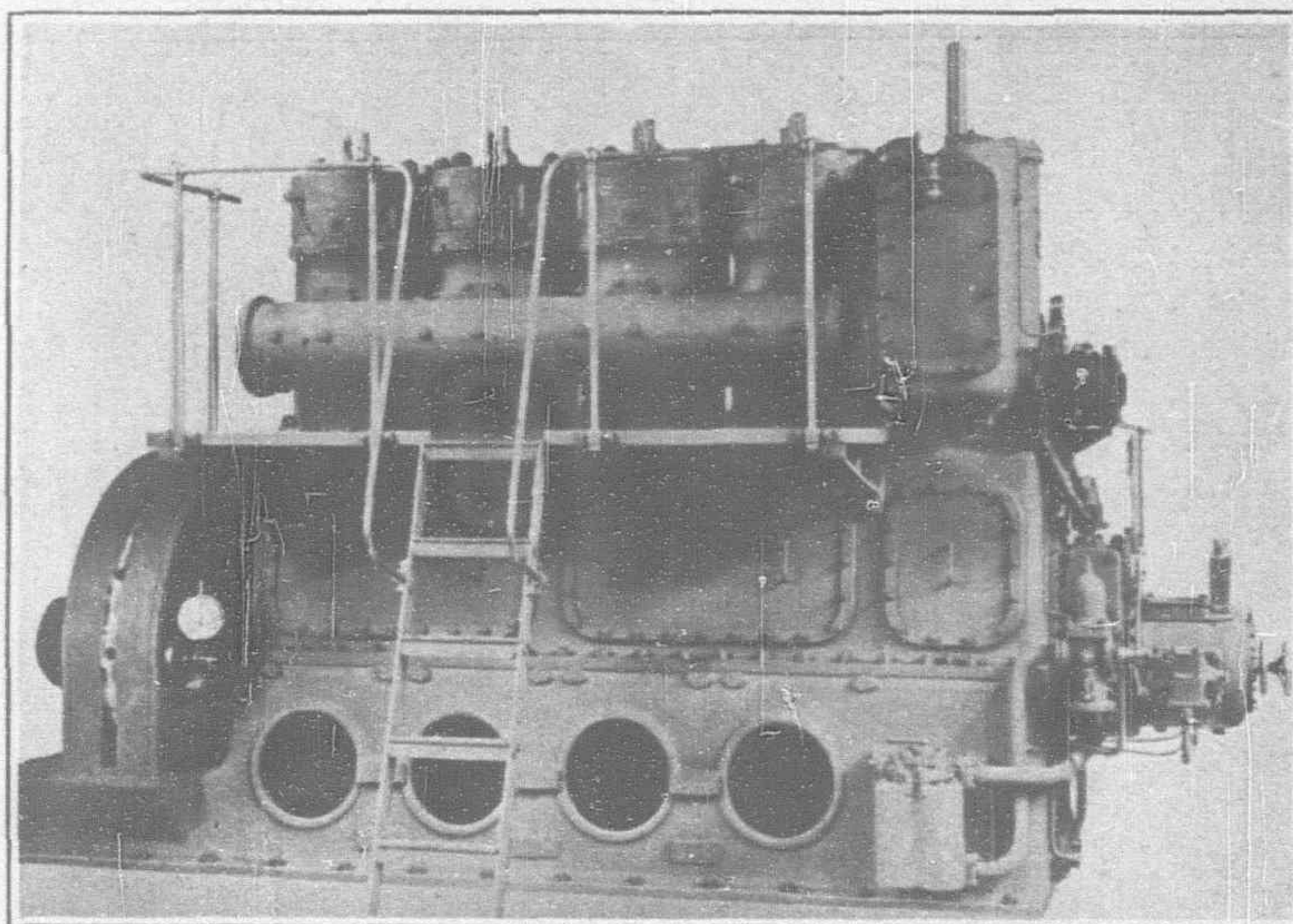
Panama, coal is about 48s. a ton. At other points coal has to be shipped out from British ports. It meant that a steamship service there was an absolute loss, and compelled the operators to turn to the Diesel engine. The new motor vessels will get all their fuel oil at San Pedro, in California, and 900 to 1,000 tons of oil, stored in double bottoms, will take one of these vessels from New York to Japan and back again, whereas 1,600 tons of coal were necessary for the voyage simply from New York to Japan. These figures show how big a saving in space the change to motor ships



with about 2 tons for the auxiliaries. This new service represents in a very practical way the arrival of the motor cargo vessel.

After a few voyages with vessels in the new fleet some very interesting data ought to be available to use in comparison with this service when it was entirely maintained by steamers.

The British end of the Roosevelt-Matsukata combination is the old and well-known Kerr Steamship Company, Ltd., which entered into the original arrangement with the Japanese for a round-the-world freight service using the steam vessels of the Kerr and K.K.K. lines. The



means. The steamers used 35 tons of coal per day, and the motor ships will use about $7\frac{1}{2}$ to 9 tons of oil per day.

There is also considerable talk about changing the drive of several large Japanese steamships from turbine to Diesel engines and some time ago it was said that the Toyo Kisen Kaisha would convert the *Tenyo* and *Shinyo Maru* to oil engined ships. It is understood that the order for the engines has already been placed in Germany, but no details are available nor have the vessels yet been laid up for the conversion to be carried out. The total power needed will be about 12,000 h.p. and it is

THE SULZER INSTALLATION ON THE N.Y.K. MOTOR SHIP *ATAGO MARU*

Top: Control Station

Centre: Front and Rear View of 2,000 B.H.P. Sulzer Marine Diesel Engine

Bottom: 250 B.H.P. Sulzer Auxiliary Marine Diesel Engine with Scavenging Pump without Compressor

believed that high speed engines will be utilized, probably in conjunction with mechanical gearing.

The Mitsubishi Shipbuilding yards are also building and equipping motor vessels and although there is no direct information about their plans the London newspapers state that two marine heavy oil engines of 600 h.p. each, were recently ordered through the Mitsubishi Trading Company from Vickers, Limited. These engines are repeat orders for similar ones sent to the Mitsubishi yards some time ago and are of the four-stroke cycle crosshead type, with six cylinders 18½ inches diameter by 27-inch stroke operating at 150 r.p.m. These engines are evidently intended for the three new vessels now under construction in the Mitsubishi yards to the order of the Osaka Shosen Kaisha.

The Osaka Shosen Kaisha is operating the *Ondo Maru* and *Kurenai Maru*, both with motor engines, in its Inland Sea service. The *Murasaki Maru*, a sister ship, was fitted with a steam engine and the comparative performances of these three ships is being studied.

It is generally considered that motor-driven vessels are better for passenger service and are faster. Also, the operating expense is about half that of steam engines, it is declared. The result is that several of the large shipping companies are constructing the new type of vessels.

Tonkin Culm as Pulverized Fuel

Early Difficulties Overcome by French Engineer

HOW to make use of culm for heating boilers is the subject of an interesting study in which Mr. M. Raby, mining engineer and chief of the bureau of mines in French Indo-China recommends pulverized anthracite in order to realize important savings in industry.

Taking as a basis some studies made in France by Mr. Sagallier, mining engineer in Grenoble and the results he obtained during experiments he made in Tonkin, Mr. Raby concludes that it has been possible to burn to best advantage, coal dust which on analysis shows 14 per cent. volatile matter and 41 per cent. ashes.

The first attempts made in Tonkin as regards making use of pulverized anthracite as fuel for boiler furnaces did not give satisfactory results. Experiments were recently made with some new machinery and it looks as if the problem had now been solved.

Unwashed culm run through a sieve in order to have a maximum size of 10 millimetres was used to that effect. It was supplied by the Société Française des Charbonnages du Tonkin.

This culm in fact is a fuel of high heating power, giving but little residue in ashes and seems at first to be of better use than Alpine anthracite on which interesting studies have lately been made.

The installation which served as an experiment was intended to heat a Babcock-Willcox boiler of 150 square metres heating surface; it consisted of only one machine of the turbo-pulverizer type. The coal introduced by hand into a feeding box went to the distributor and was then crushed in a pulverizer composed of three disks with paddles made fast on a shaft turning at 1,750 revolutions per minute. A ventilator adapted on the same shaft drew the pulverized coal and carried it to the burners.

The results obtained were very satisfactory and, according to the report of the owners, the cost price of steam produced by heating with pulverized coal is considerably lower than steam made in boilers with stationary grates; taking into account the cost of upkeep due to replacing frequently certain parts of the turbo-pulverizer.

Owing to the economic development of the colony, the local consumption of fuel increases in greater proportion than does the output. Indo-Chinese manufacturers in making use of the new heating process by pulverized anthracite would bring about a more favorable situation. Manufacturers, however, have up till now been in the habit of using a graded product and the culm which is being mined in large quantities by the local companies, is mostly exported. The statistics of 1922 show the following figures:—

| | |
|--|--------------|
| Total production of the coal mines in Tonkin | 989,000 tons |
| Total exports | 536,000 tons |
| Local consumption | 453,000 tons |
| Exports of graded coal from Hongay | 109,000 tons |
| Exports of culm | 397,000 tons |

It would be to the interest of the colony if this situation came to an end and that the home market absorb the production of anthracite culm which up to the present time has been exported.

The new process of heating requires the acquisition of pulverizing machinery and also the transformation of existing installations, but the results obtained show that in the aggregate these expenses are more than compensated by the lower production cost of steam in making use of low-priced fuel.

It must be said that during the experiments made in Tonkin only Hongay culm was used; this has a very small percentage of ash. The selling price of this culm (\$5.80 f. o. b. Hongay) is rather high in comparison to anthracite culm from the Dong-Trieu mines which sells as low as \$2.50 (spot Haiphong) but has a high percentage of ash, 15 to 20 per cent. It is not likely that difficulties would be encountered due to the inferior grade of fuel, as such coal is now being used in the Alps, the percentage of ash being not less than 18 per cent. and sometimes as high as 35 per cent.

The use of culm having a high percentage of ash would benefit the buyers as well as the producers who might then be induced to work certain coal beds considered until now as too poor in graded coal.

The process of heating with pulverized coal is bound to be developed in Tonkin and should also be of interest to manufacturers of the other states of the union, particularly Cochin-China; this market, which is solely dependent on importations, took in 1922 61,000 tons of coal, 56,000 being anthracite from Tonkin.

Owing to the general increase in demand there are difficulties in supplying the Saigon market, so much so that recently certain buyers were obliged to secure coal from the Dutch Indies at the price of \$15.50 per ton delivered Saigon. If one considers that freight rates from Hongay to Saigon can be obtained at \$3.50 per ton, for a minimum of 2,000 tons, it seems that culm from Tonkin costing not more than \$9.50 delivered Saigon, would be of great service to the local industry.

It is to be hoped that in view of the good results obtained, the manufacturers of French Indo-China will gradually come to use Tonkin anthracite culm in pulverized form, and that the development of this heating process, in bringing about lower manufacturing costs and to the miners larger opportunities of selling a hitherto neglected product, will be the source of a new economic impetus to the colony.

Bagasse Made into Boards

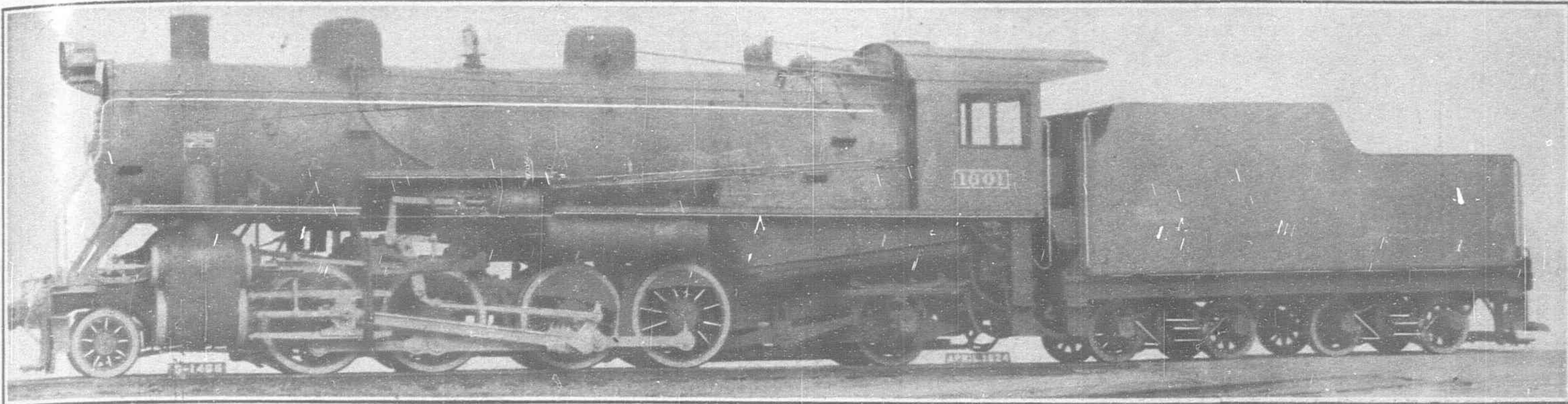
As romantic as "making two blades of grass grow where only one grew before" is the achievement of a group of paper workers, lumber men and chemists of Minnesota, U.S.A., who have just worked out a process whereby one of the liabilities and nuisances of sugar plantations has been converted into an asset capable of producing revenue amounting to a million dollars a year.

The waste product which has been thus transformed is bagasse, the fibrous residue of sugar-cane after the juice has been extracted. Formerly this substance was burned under the boilers of the sugar mills, not because it is a good fuel, as it isn't, but because there was no other way to get rid of it.

By the process just perfected, the bagasse is fed into a cooker, where it is combined with chemicals and small amounts of old newspapers, and then as a pulp is fed into rolls and finally into an enclosed drier, coming out at the end an absolutely dry board. Its commercial possibilities are several. It is used in refrigerator cars and cold storage warehouses, in the manufacture of fireless cookers as insulating material, and, most of all, in the building of dwelling houses, where it serves as sheathing, plaster base and wall.

Electric drive is used throughout in the big plant at New Orleans which turns out this product and which represents an investment of \$2,000,000. The power equipment, built by the General Electric Company of America, comprises a 2,500 kilowatt turbine generator, a thirteen panel switchboard, and a miscellaneous installation of motors for driving the various units, aggregating about three thousand horse-power.

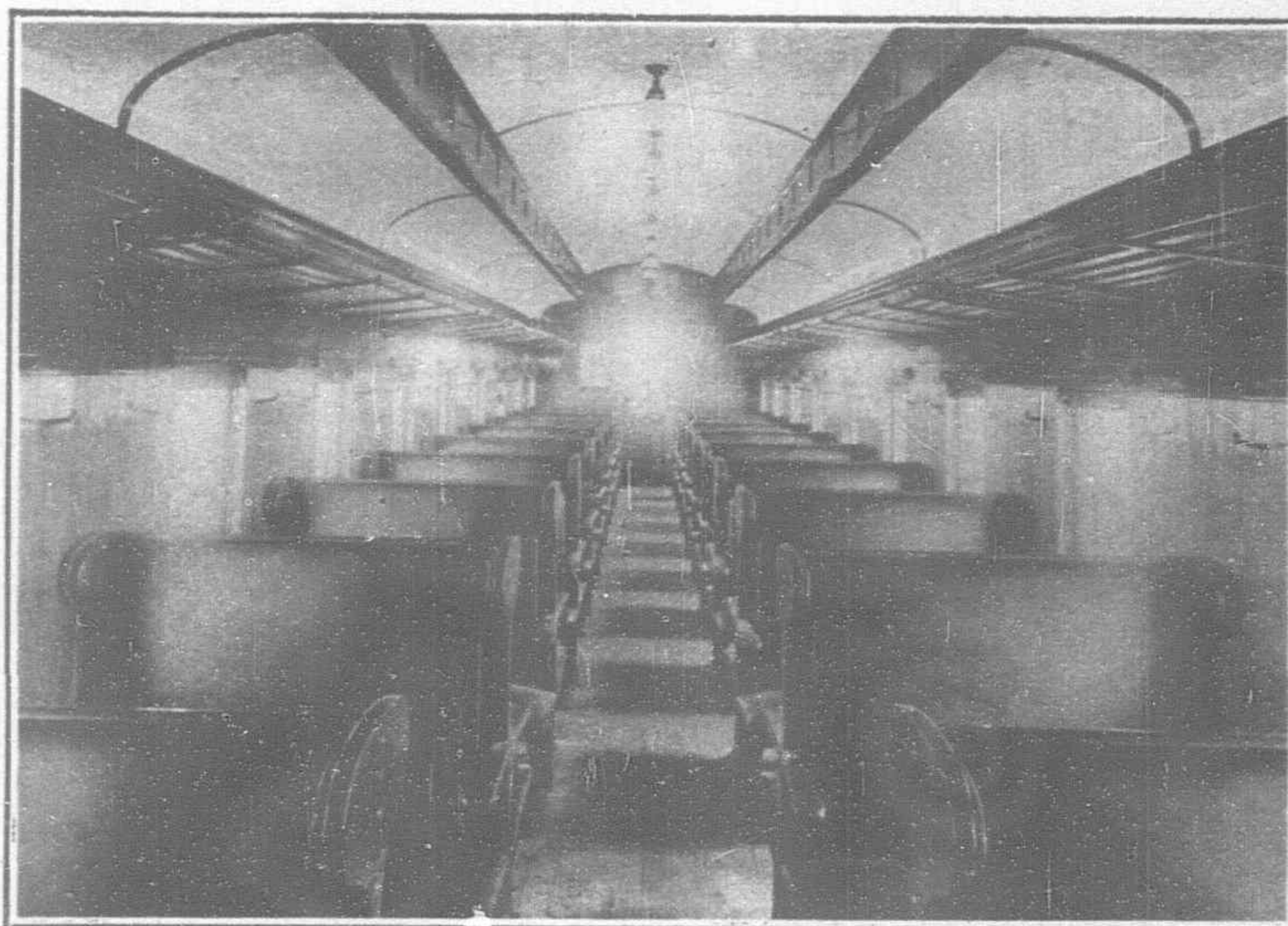
The effect of this constructive process in making something worth while out of former rubbish is to save thousands of dollars to the planters, create thousands of tons of freight for railroad and steamship lines, and reduce the cost of building operations.



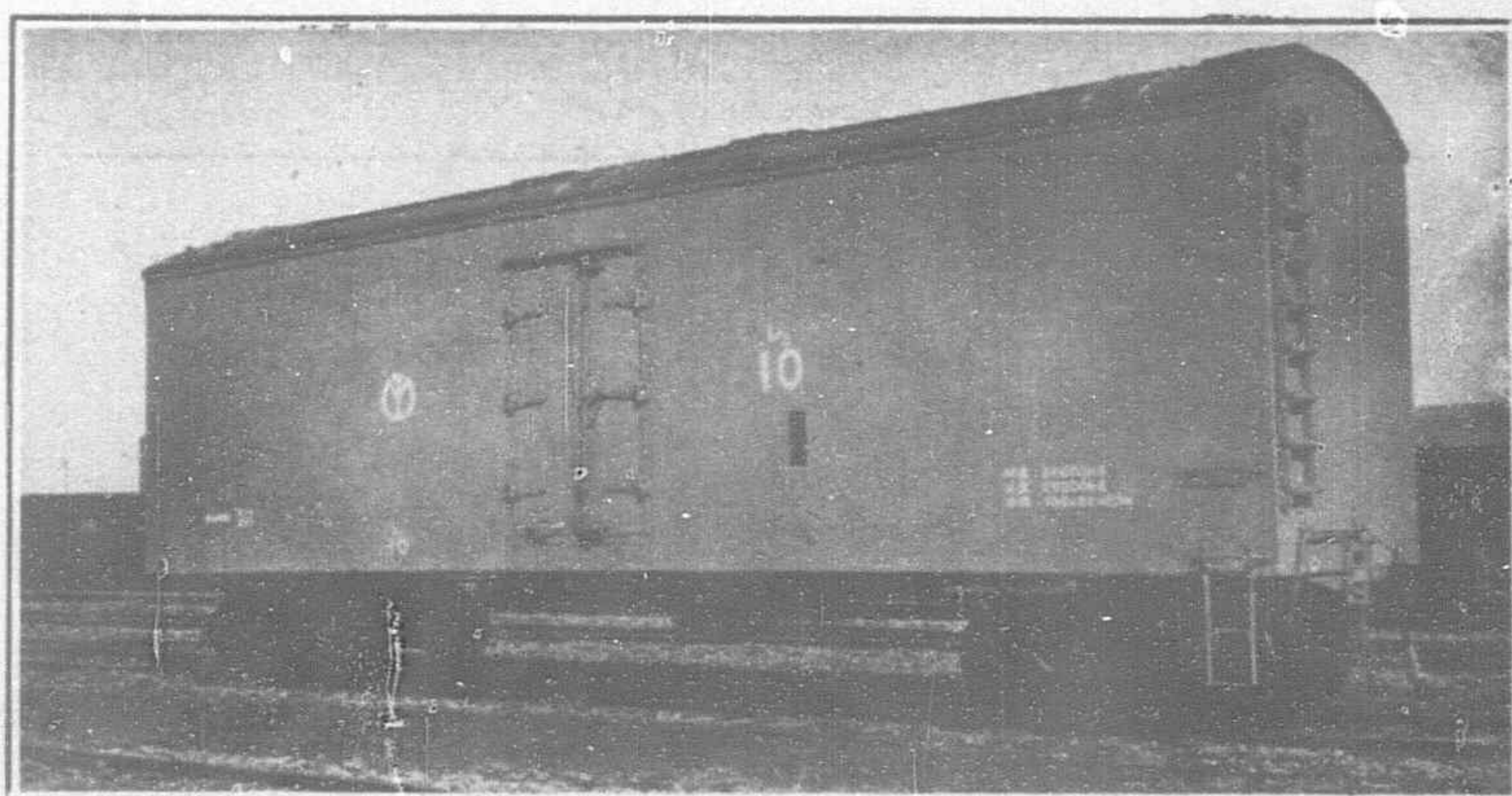
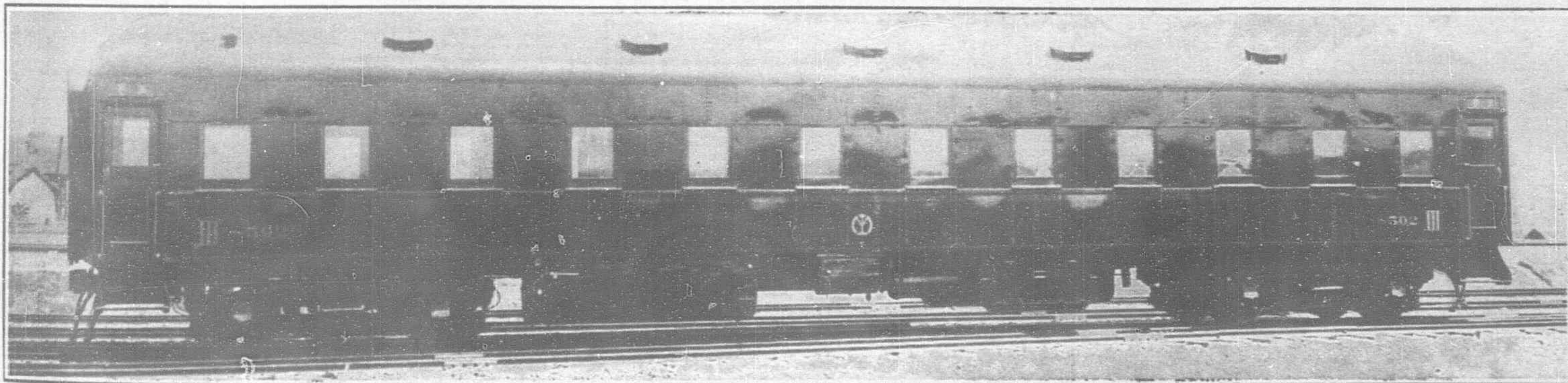
Three Cylinder Tender Type, 8-wheeled Locomotive for the South Manchuria Railway built at the Schenectady Works of the American Locomotive Company

Three-Cylinder Locos and All-Steel Cars for the S.M.R.

IN our last number appeared an illustration of the new all-steel cars for the Kobe municipal tramways now under construction at the Tanaka Iron Works in Osaka. The imperial Japanese government railways is also conducting investigations with the view of superceding its wooden passenger coaches with all-steel cars on the main lines of communication and is watching with considerable interest the experiments made by the South Manchuria Railway Company whose great shops at Shakako near Dairen has built several of this type for their own use.



these all-steel cars in the Shakako shops is slightly higher than the cost of importing them from foreign makers, so there is no immediate intention on the part of the S.M.R. authorities to build further coaches of this type at their own shops. Our illustration show the exterior and interior of the standard third-class passenger all-steel coach turned out by the Shakako Works and we also reproduce the illustration of a new type of refrigerating car for the S.M.R. built at these shops. This type of car was also designed by the S.M.R. engineers to keep in close touch with the developments of the cold storage traffic in meats and



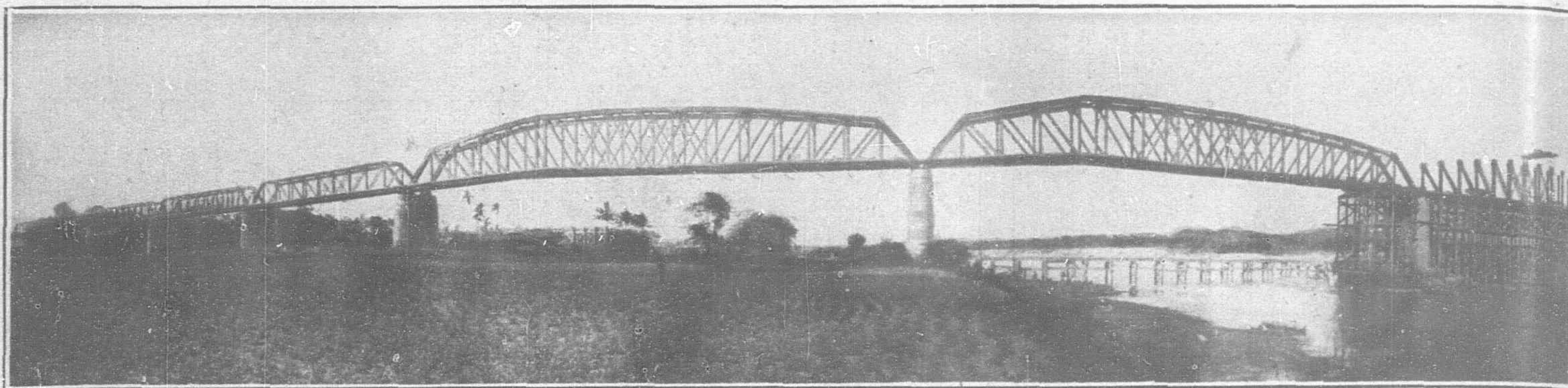
Interior View of Third Class All-Steel Passenger Coach Built at the Shakaku Works of the S.M.R.
Exterior of Third Class All-Steel Passenger Coach Refrigerator Car for the S.M.R.

fruits from Manchuria for the Japanese market. The peculiarity of these cars is that they can be converted at will into refrigerator or santhermic cars. On their trial test the temperature inside the car was maintained at 4 deg. C. while that outside stood at zero. The interior of the car is lined with asbestos. Several of this type have been turned at Shakako and are in service for transporting fruits and other perishables susceptible to freezing temperature.

In April of this year the S.M.R. ordered from the American Locomotive Company five

(Continued on page 497.)

These shops are fully equipped for turning out this class of work and as an experiment four were originally built under the supervision of Dr. Yokui, director of the shops, and their operation carefully watched by the operating department of the railway. These first experimental all-steel coaches were found to be unsuited in some respects for the climate and certain modifications were made in the newer cars which are now proclaimed eminently suitable for the traffic. For the present, however, under prevailing economic conditions with its high costs of manufacture, the cost of constructing



The Guillemard (Kelantan) Bridge from Down Stream Side, South Bank

Federated Malay States Railways in 1923

ANY noteworthy improvements and extensions were made in the Federated Malay States Railways during 1923. Among them were the opening of the Guillemard Bridge on the Kelantan section of the east coast line, the completion of the Jelai bridge on the Pahang section, the opening of the Johore causeway and the first train service on the new Penang hills railway. The working of the railway produced a net profit of \$1,710,349 as compared with \$2,004,005 in 1922, this year's profit being a return of 0.89 per cent. on the capital expenditure of \$191,975,106. The expenditure on new lines was \$2,042,034, and for widenings and additions, including the Johore causeway and new wharves at Prai was \$4,746,750.

The receipts from all sources were \$14,675,106 an increase of \$858,782 or 6.22 per cent. Against this is charged expenditures of \$12,964,757 an increase of \$1,152,438 or 9.76 per cent. Passenger traffic increased by 2,217,051 or 26.7 per cent. over 1922. Parcels and goods traffic also showed a substantial increase of \$795,733. The mileage was 1,044, a gain of 22 miles. Fuel costs were \$97,000 higher, but this is largely offset by the decrease in lubricants of \$71,000. Fuel costs per engine mile were 30 cents a mile, an increase of one cent over the previous year, but the total running costs per engine mile are 51 cents as compared with 53 cents in 1922.

One of the interesting features of fuel costs is the comparison between the wood of the mangrove type and that of the jungle as against imported coal. The railways are in a position to make this comparison as they have both types of engine constantly at work. Mr. Anthony figures that "bacau" or mangrove wood is required to the extent of two and one-half tons for one ton of imported coal. Jungle wood, however, is only one-third the value of the coal. The railways also use Rawang coal which is used in the proportion of 1.66 tons to one ton of imported coal. The fuel consumption works out at 66.51-lbs. per train mile as against 66.62-lbs. in 1922, considered in terms of imported coal.

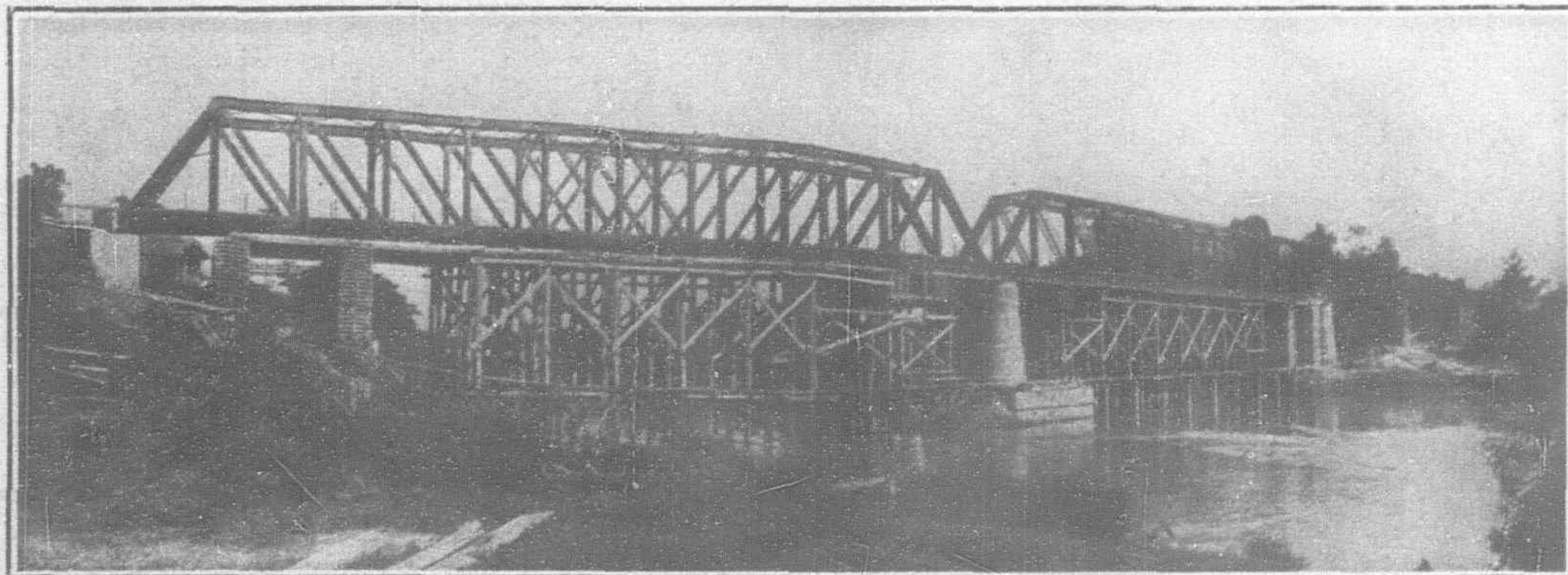
The running line was maintained at a cost of \$151.82 a mile per month, and the total maintenance cost was \$233,700 more than a year ago. The total engine mileage including maintenance mileage was 5,028,925 a gain of some 200,000 miles due to additional train service.

The railway administration has been concentrating on the east coast line of which the principal sections are the Kelantan and Pahang ones. The Kelantan section starts from Tumpat and proceeds southwards towards Kuala Lipis in Pahang, the distance from Tumpat to the Pahang-Kelantan boundary being 140½ miles. The line from Tumpat to Tanah Merah (32 miles) was opened for traffic on July 1st, 1915. All necessary land has been acquired to the Pahang boundary from Tanah Merah. Felling and clearing have been completed as far as the 89th mile. Main line earthwork between Kuala Krai and Manek Urai is completed, except for gaps left for culverts and bridges. Between Manek Urai and Kuala Pergau the work has proceeded slowly for want of funds. Six hundred thousand two hundred and six cubic yards of earth, and 120,557 cubic yards of rock have been excavated for main line, 33,526 cubic yards in stream deviations and 82,800 cubic yards in station yards. Rails have been laid as far as the 61st mile. The line between Tanah Merah and Kuala Krai is approaching completion, the only works of any size remaining to be completed being Kusial station and three bridges.

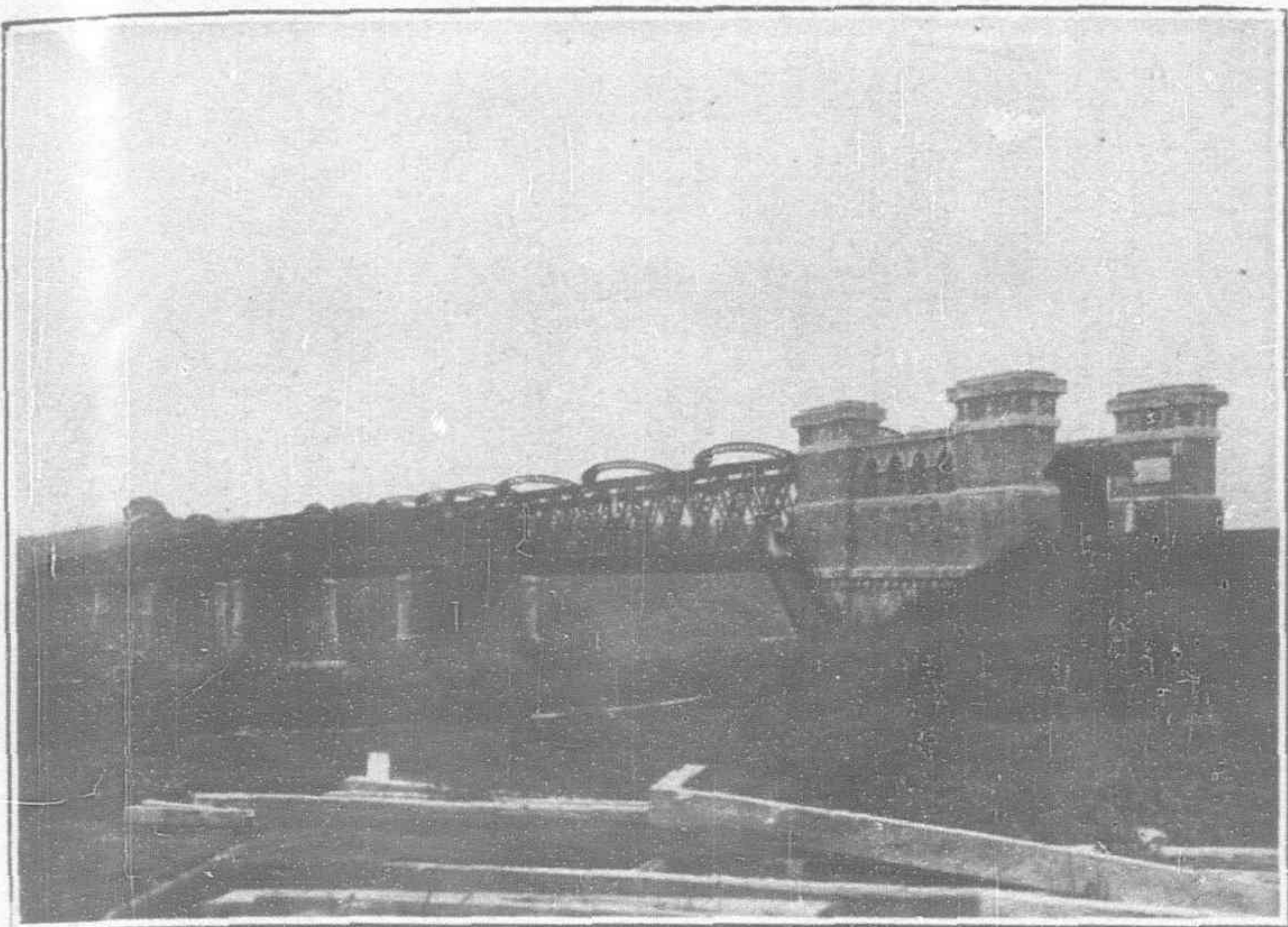
One of the most important works on this line is the Guillemard bridge which was opened with great ceremony on July 23rd, 1924. The bridge is named in honor of Governor Sir Laurence Guillemard, who cut the cord that bound it with a golden kris presented by the Sultan of Kelantan.

The total length of the bridge, including the approaches, is 2,160-ft., and it consists of five spans of 250-ft. each and five spans of 150-ft. each. The normal width of the river is 1,050-ft., but it widens out in flood time to 2,080-ft. The depth of the river varies from nine feet to 40 feet. The height of the beam of the girders above the river-bed is 55-ft. The total weight of the steel work which has gone to make the bridge is 2,800 tons. The abutments and piers are all founded upon wells which, in some instances, have been sunk to a depth of 57-ft. below the river-bed in order to secure good foundations. The construction work began in April, 1920, and was completed in April, 1924. It is the longest bridge in the

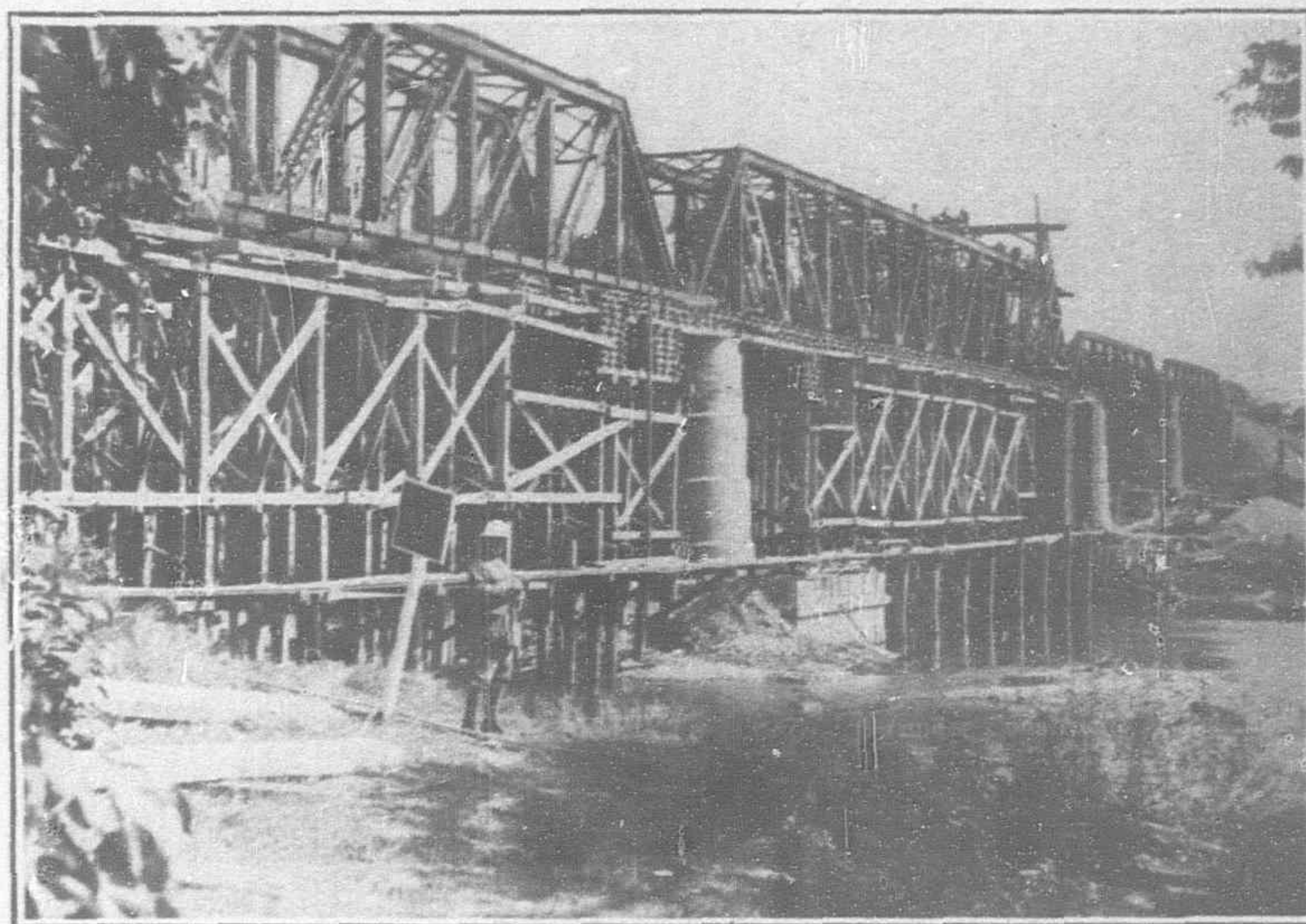
Malay peninsula and longer than any in Siam, being longer even than the bridge over the Menam near Bangkok, of which an account appeared in the September issue of THE FAR EASTERN REVIEW. The bridge was designed and carried out entirely by the construction department of the F.M.S. railways.



Jelai Bridge on Pahang Section of East Coast Railway



Victoria Bridge over Perak River at Enggor



The Jelai Bridge over the Pahang, under Construction

Seven other small girder bridges and all foundations, piers and abutments for the Nal bridge were also completed during the year. The expenditure amounted to \$1,702,132.

The East Coast Railway, Pahang section, was opened for traffic as far as Kuala Lipis (141½ miles from Gemas) in October, 1917. The section from Kuala Lipis to Padang Tungku, five miles 49 chains in length, was opened for traffic on the 16th March, 1921, and the section from Padang Tungku, mile 147½, to Chigar Perah, mile 163½, was opened for traffic on 15th November, 1923. The work now in progress commencing from Chigar Perah runs northwards towards Tumpat. The distance from Chigar Perah to the Pahang-Kelantan boundary is 24 miles and the total distance Chigar Perah to Tumpat is 164 miles. The distance from railhead, Pahang, to railhead, Kelantan, is 98 miles. During the year 38,865 cubic yards of earthwork were executed on the main line and 14,026 cubic yards in stream diversion of which 695 cubic yards were rock. Two thousand six hundred and forty-six cubic yards were done in station yards and 16,002 cubic yards on account of slips. The Jelai bridge, which is the largest on the section, consists of two spans of 200-ft. and two of 100-ft. Considerable difficulties were experienced in the mid-stream foundations, but the bridge was completed early in November, 1923.

Messrs. Topham, Jones and Railton, Limited, contractors for the Prai jetty, wharves, etc., commenced work in May, 1918. The land works under this contract including the blockwork wall with the exception of the gap left opposite the old Prye Dock, were completed. Unexpected difficulty was met with in dredging owing to the excessive siltage.

The contract for the causeway across Johore Straits was let to Messrs. Topham, Jones and Railton, Limited, who commenced work in June, 1919. The lock at Johore was taken over by the Federated Malay States Railways on the 1st January, 1923, and has been in

regular use by shipping since that date, the total number of craft passing through the lock during the year being 13,513. The rolling lift bridge, carrying the railway and roadway across the lock, was completed, the operating cabin was erected and the electrical operating and controlling gear was installed and connected with the Johore power station. On the opening of the causeway for railway traffic the wagon ferry power house and the landing stage on the Johore side of the Straits were dismantled and removed to allow the east and west wing walls of the lock to be completed.

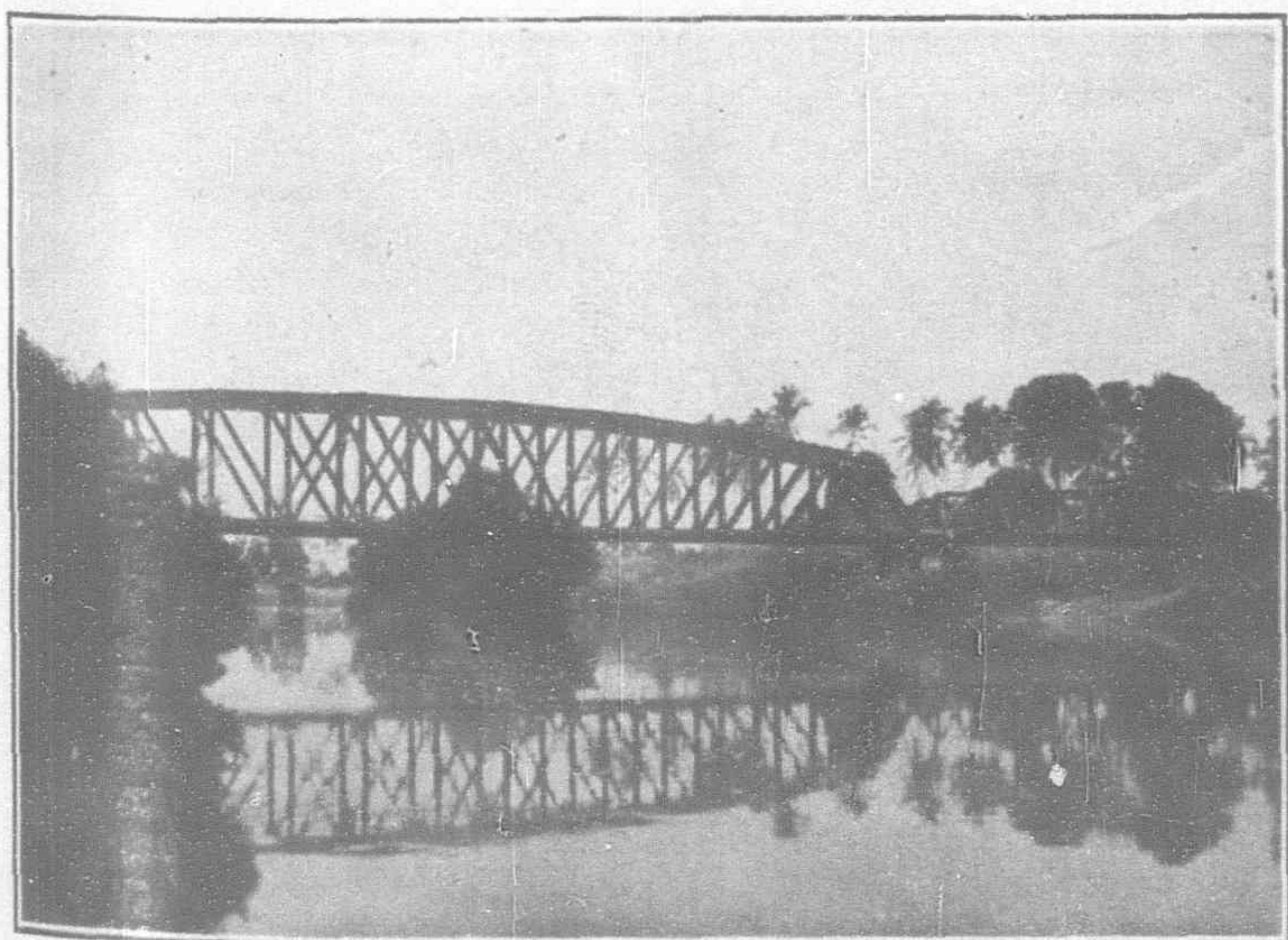
The Penang hills railway† line was completed and opened for passenger traffic on 21st October, 1923. This railway was handed over to the colonial government as from 1st January, 1924, and is being operated by the Penang municipality.

Three-Cylinder Locos and All-Steel Cars for the S.M.R.

(Continued from page 495.)

three-cylinder locomotives the first of their type to be used in Asia. These are now being delivered and will be placed in operation this month. The type is known as a "Three-cylinder 8-wheeled tender locomotive and are built to the following particulars:—

Gauge, 4-ft. 8½-in.; cylinders, 22½-in. d. by 26-in. stroke; driving wheel diam., 54-in.; boiler, inside d. 80-in., pressure, 180-lbs.; fire box, length, 114½-in., width, 84¼-in.; tubes, No. 245-42; diameter, 2-in.-5⅜-in., length, 18-ft. 6-in.; wheel base, driving, 15-ft.-10-in.; engine, 34-ft. 2-in., engine and tender, 62-ft. 7¼-in.; weight in working order (pounds) leading, 21,000; driving, 194,000; trailing, 48,500; engine, 263,500, tender, 135,500. Heating surfaces (sq. ft.) tubes, 2,361; flues 1088, fire box 217, arch tubes, 29, total 3,695; superheater, 945; fuel, soft coal; grate area, 66.8 sq. ft. Maximum tractive power, 56,000-lbs.; factor of adhesion 3.46; capacity, water, 6,000 gals., fuel, 10 tons.



The Kedan Bridge



Lipis River Bridge, Pahang

China Begins Strawboard Manufacture

Potential Source of Wealth Now Destroyed to be Turned Into Dollars by Modern Paper Mill Machinery

SEVERAL million tons of rice straw are burned or go to decay in the oriental section of the world every year and this waste product, in fact, is a serious problem in some localities where it is piled up and allowed to decay, furnishing breeding places for beetles and other noisome creatures, for the discomfort of the dwellers roundabout until they are goaded to apply the torch when no purchaser appears to take over an asset that finally becomes a serious liability. Yet this straw whose value in even the most sanguine of Chinese minds, is some 40 cents a picul, is a potential source of wealth and if turned into strawboard can be sold for \$100 a ton. The cost of conversion is not so great either, only the capital required to instal even a 20 ton mill is considerable and that naturally acts as a deterrent in the minds of the villagers who still think in cash and whose eyes are blinded to the distant dollar by reason of the near-by cent.

To those who know China and the consummate ability of the Chinese to extract the last ounce of profit from every transaction, it will come as a shock to learn that in all the region around Shanghai, one of the granaries of China, only one installation for the utilization of rice straw is in operation, although two more are in process, one of promotion and the other of building. The following article tells of the equipment and layout of two of these mills, the more modern of which is that of the Ho Fone Strawboard Company, now under construction at Kashing.

As to the demand for strawboard, little need be said except that prices for this material are steadily rising due to an increasing demand for it as containers, even food products formerly packed in tins now come to market in the cheaper containers made of strawboard dipped in paraffine or some other similar material to make them air and moisture tight. The demand in China for all grades of cardboard is steadily increasing and importations now reach such a considerable sum that the promoters of the new mills have no fear of glutting the market for many years to come.

Ho Fone Strawboard Factory at Kashing

The latest development in one of China's "infant industries," that of turning waste rice straw that often has to be burned to get it off the landscape, into a valuable commodity such as strawboard, is the Ho Fone Strawboard Mill at Kashing which is now in process of erection by engineers of the American Trading Company's Shanghai branch. The mill is designed to turn out 20 tons of strawboard every day and every effort is to be made to manufacture high quality board for special purposes rather than the cheaper, rough board that is ordinarily found in the China market. The

high quality board, it is anticipated, will replace quite a large volume of that at present being imported into the country.

The mill is advantageously situated with water transportation on two sides, one being a canal and the other a small river which flows into the Grand Canal near the site of the mill which is 540-ft. long by 210-ft. wide, affording ample space for the present plant and for a future extension to double its capacity. Storage space for coal and lime also is provided, while the straw, owing to the fire risk will be stored on the other side of the river across from the plant. The mill whose capacity was based on the actual amount of raw material easy to secure, will use only straw from the Kashing area, including the output from near-by towns and its.

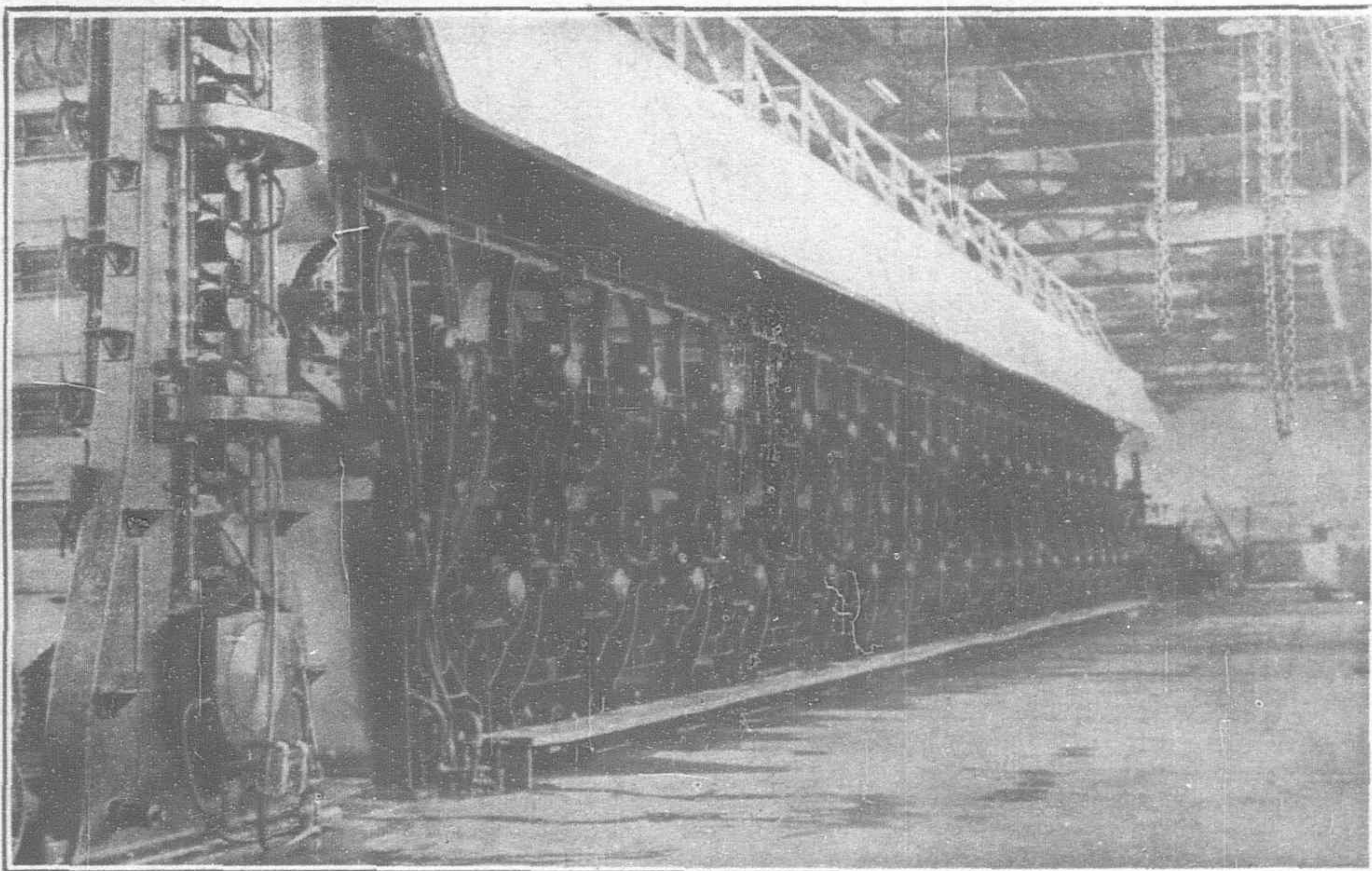
The operation of making strawboard consists in cooking the finely chopped straw in milk of lime. For the present at least, the mill will depend upon near-by supplies of lime kilns situated near Kashing, but plans for burning its own lime, to secure better quality and at the same time cut down expenses, are being considered.

The straw cutting shed on the north side of the plant is equipped with comminutors of the Monarch type, supplied by the Silver Manufacturing Co., of Salem, Ohio. These have a capacity of 40 tons for each ten-hour day, the double capacity being installed to obviate the fire risk of cutting straw at night. From the cutters, the straw is

blown by fans attached to the cutters up through a chute to the straw storage space on the upper floor from which it is charged by gravity into the rotary digesters. On this upper floor also are located the lime mixing tanks where the quick lime is dissolved and the lime liquor or lye is fed to the three rotary digestors which are of the McNeil type, fourteen feet in diameter, revolving about once in 3 minutes. Here the straw is cooked with live steam from the boilers for some four hours, effort being made by slow and thorough cooking to improve the quality of the resultant pulp.

The boiler plant consists of two 210 horse-power, cross drum water-tube boilers supplied by the Keeier Boiler Company of Williamsport, Pa., which are fed by two duplex feed water pumps 6 by 4 by 6-in. made by the Union Steam Pump Company of Battle Creek, Mich. The Swarthout feedwater heater by the Walworth International Company consists of two units. The boilers at the start will be hand fired, but Ajax shaking grates will be installed later.

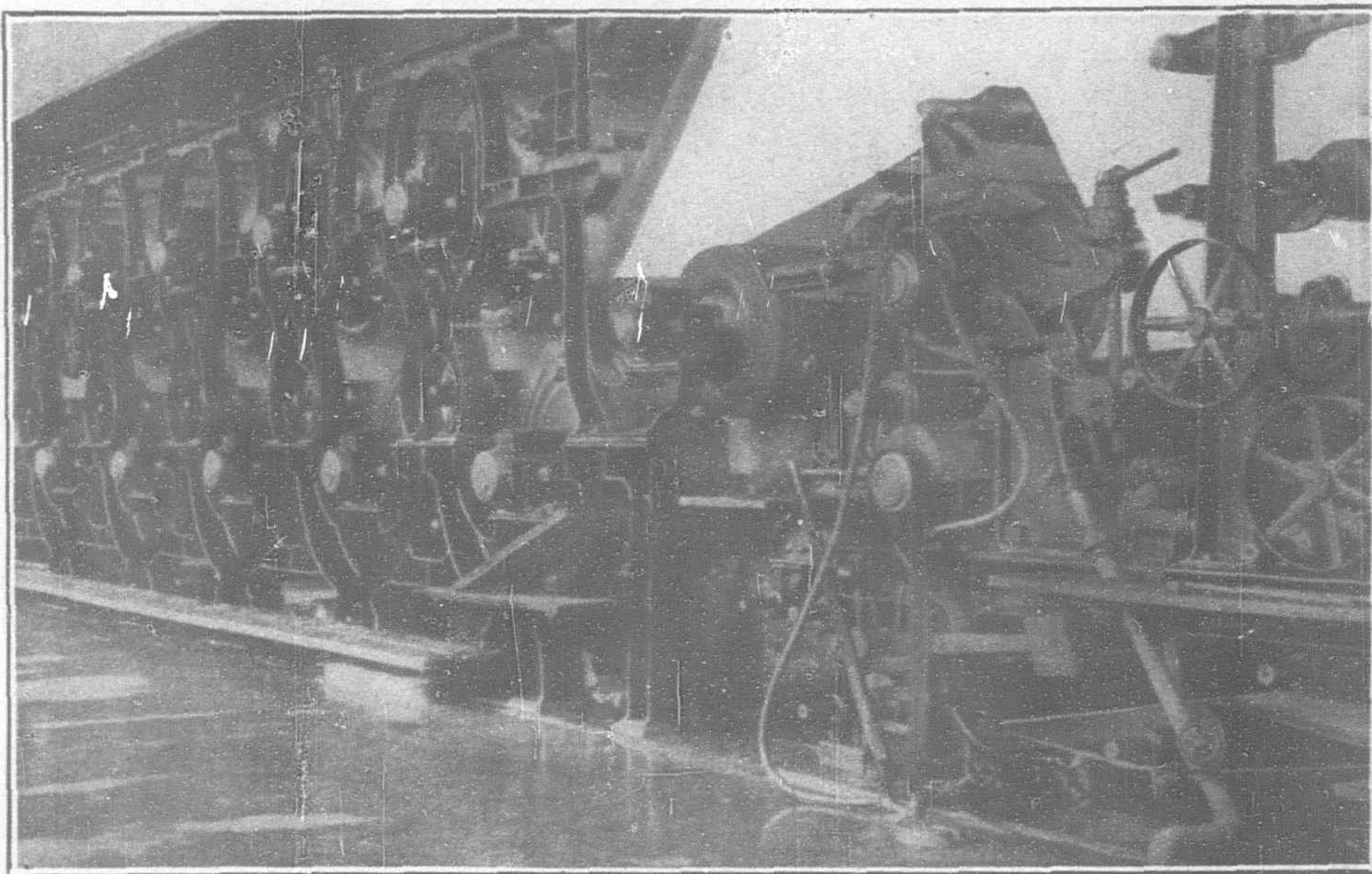
After cooking in the boilers, the pulp goes to a specially constructed pit fitted with drum washers which form one of the main improvements in this mill over other similar installations elsewhere in the world. This unit takes out the larger percentage of foreign matter, dirt, sand, and all the other impurities that may have made their way into the digestors with the straw. The use of this washing pit lightens the load immensely on all the other preparation machinery that follow, since the latter operates on clean pulp and not a mixture of pulp and dirt. These washers, as well as the stuff chest of a special type, were designed by the



Type of Bagley & Sewall Calender and Steam Drying Rolls to be Installed in the Kashing Strawboard Mill

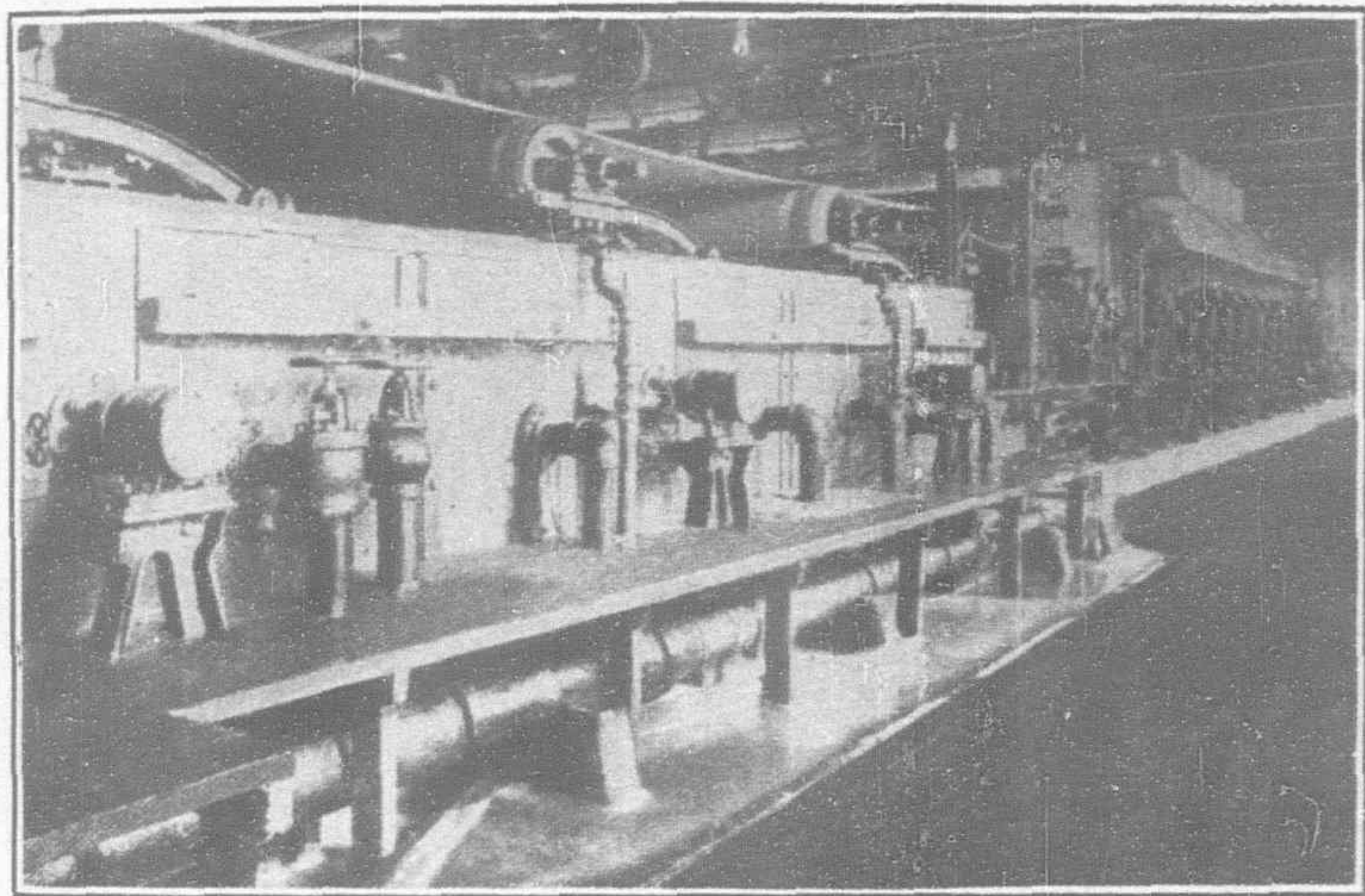
American Trading Company's engineers, amongst whom is a paper mill expert, to meet precisely the conditions that prevail in China. They also remove a good portion of the spent lye and deliver a purified product to the pumps.

The cooked and washed straw then goes to the six-inch Worthington Volute centrifugal pumps which elevate it to the beaters. These are of the hollander type as used in paper mills, being oval concrete tanks divided down the middle by a midfeather round which the straw pulp must circulate to

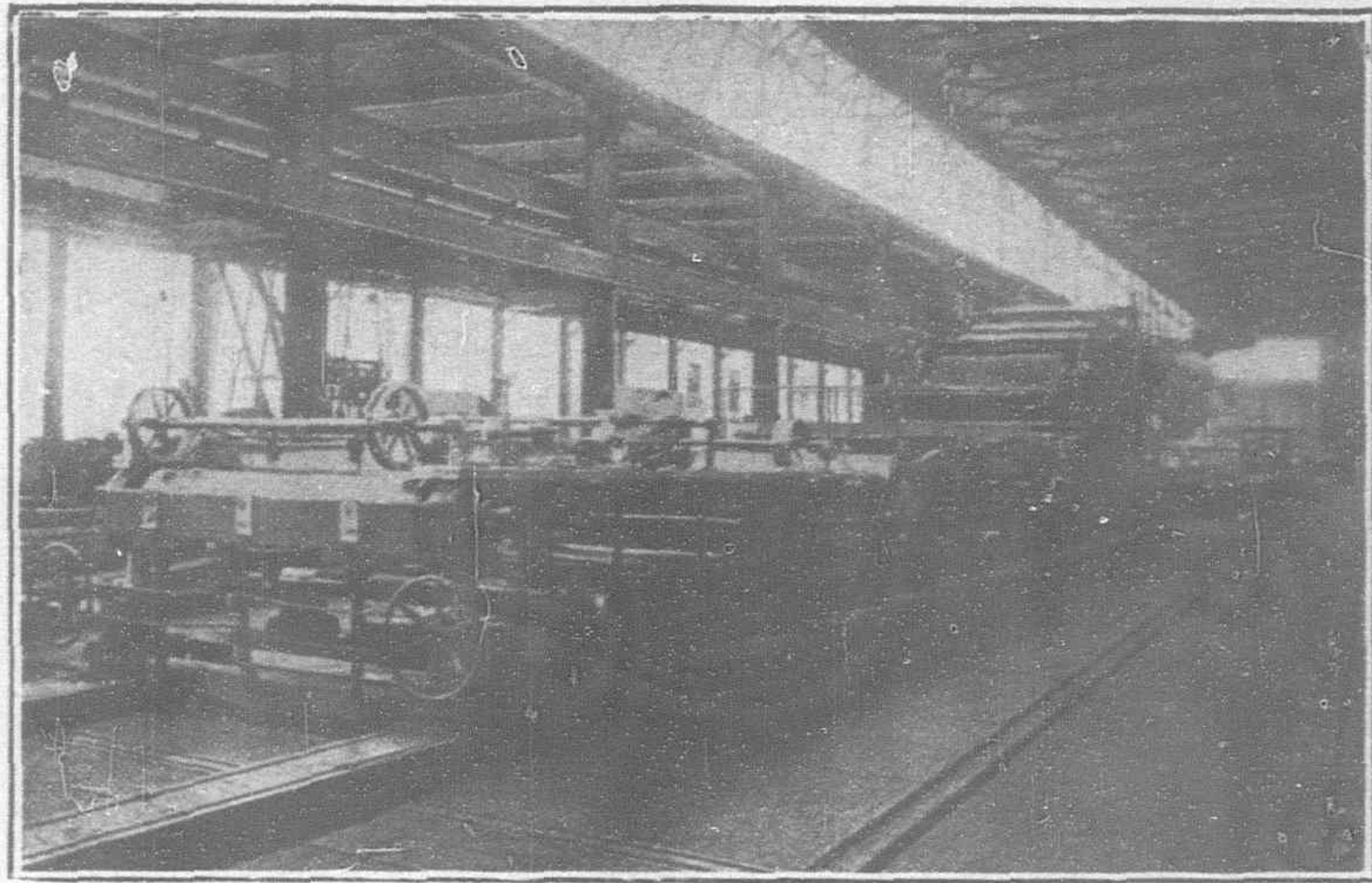


Portion of Second Press and Dryer Rolls which Convert Compacted Pulp into Coherent Sheet of Strawboard

what are known as the Jordan engines. These machines are cone shaped and are 4 feet $3\frac{1}{4}$ inches long with an interior revolving plug that ranges in diameter from two feet three inches at the larger end where the pulp is discharged, to $12\frac{1}{2}$ inches at the smaller end where the pulp enters. The Jordan plug revolves at 375 revolutions a minute and as it has 72 bars on the plug and 176 on the shell, these bars acting for all intents and purposes as knives, the pulp is evenly reduced to fibers in a very fine state of division. Only one Jordan is now being



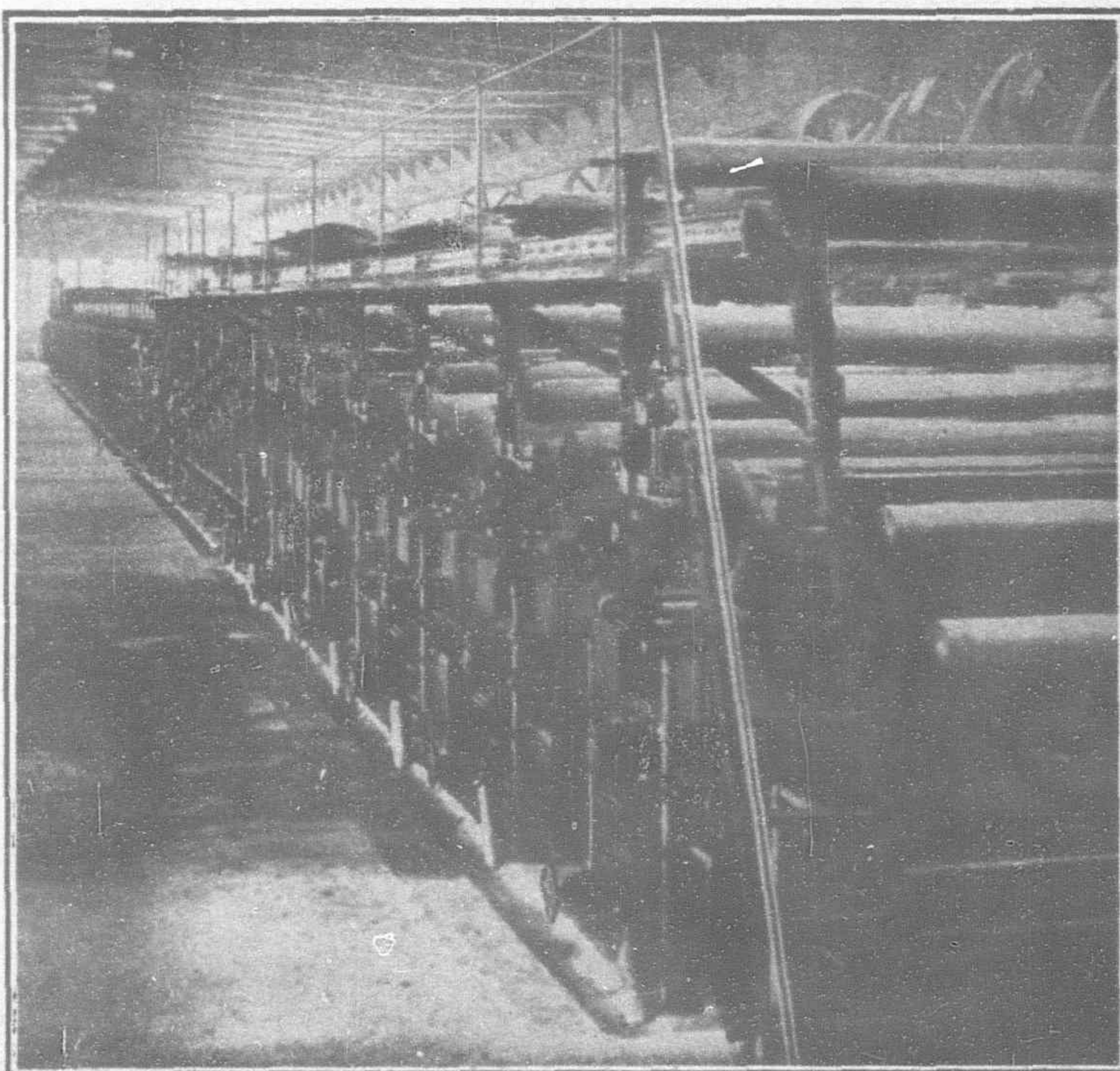
Wet End of 4-Cylinder Machine where Pulp is formed into Wet Sheet on the Cylinder Molds



Machine in Process of Erection for Test at N.Y., Watertown Works of Bagley & Sewall Co.

pass many times under the knives of the three beaters. These hollanders are made by the E. D. Jones Company of Pittsfield, Mass., and are two left and one right hand drive. The essential part of the beaters consist in 48-in. by 52-in. rollers each fitted with 62 blunt knives, technically known as "fly bars" which mash the boiled pulp across the stationary knives, one roll complete with fly bars weighing a little over three tons. Owing to the previous washing, the beaters have much easier work than in other mills where this feature is omitted as washing and beating is performed in one operation.

Each beater holds a charge of 1,200 pounds of pulp, freed from the last traces of foreign matter that may have clung to it. The straw pulp is discharged into a stuff chest and then pumped through stuff pumps made by Bagley & Sewall to



Six Cylinder Strawboard Mill Ready for its First Test Run

installed, but room has been left for a second when the plant is enlarged. This machine alone takes some 50 horse-power.

From the Jordan, the pulp is discharged to the board machine, the wet end of which is preceded by 2 ten plate flat screens of Bagley & Sewall make from which it travels to the mixing box thence into the vats in which rotate four cylinders 36-in. in diameter and 88-in. wide covered with wire cloth. On each one of these cylinders a web of wet pulp is formed which the bottom felt (of wool) picks up, and under the action of the couch roll, first one, then adds to this the others in turn until all four combine in one sheet, which then passes over the suction boxes and squeeze rolls to extract the moisture as far as possible. The 4-ply web is still carried by the bottom felt with the aid of another felt called the top felt, which send it through,

three sets of so-called "Baby" presses which have rolls 12-in. in diameter by 88-in. face. The top felt, relieved of its burden then returns to be cleaned of adhering bits of pulp. This cleaning process comprises whipping the blanket-like felt, washing it and restoring it to working conditions as regards face and texture.

The web, or embryo sheet of board, then goes to the first of the main presses which consist of top rolls of iron, 16-in. in diameter by 87-in. wide, and bottom rolls, rubber faced, which are of the same diameter as the iron ones, but only 86-in. wide. The web having come into contact with the bare polished surface of the iron roll then passes over the reversing device which insures that the side of the paper that was in contact with the iron roll of the first press now comes into contact with that of the second press. Then after passing through these main presses, the board gets its first heating since it left the cookers, and is passed over a receiving steam heated dryer which is 30-in. in diameter and 84-in. long. This dryer is steam heated.

Then the web, partly freed from moisture, passes into the most expensive item of the machine—a battery of 24 dryer rolls each 48 by 84-in., heated with steam led from the engines' exhausts. These are drying cylinders beautifully machined, not only are the faces ground, but the interior of the shell also is machined so that the thickness of the shell is absolutely even throughout. These rolls weigh 5,200 pounds each and are about one inch thick. The now practically dry strawboard sheet then passes to the reeling machine and from here to the calendar rolls which further compact the board and put upon it that final finish which adds so much to the appearance and market value of the finished product. These rolls are six in number the bottom one being 16-in. in diameter by 82-in. in width, then comes a 12-in., then three 10-in. ones with another 12-in. roll at the top. These calendar rolls are furnished by the Farrell Foundry & Machine Co., of Ansonia, Conn., and weigh eight tons without the frame in which they are housed. The strawboard, which started through the process as a comparatively thin, fragile web, now is a firm and compact sheet of board which is ready for cutting to size and making ready for shipment. The cutter which it next passes, has five pairs of "slitters" which trim off the rough edges and divide the sheet in widths of 25-in. while a revolving knife cuts these to the required sizes, ordinarily, in China, 25 by 30-in. The trimmings are then sent back into the pulping units for working over into pulp again while the finished sheets are inspected, counted and made up in bundles of 50-lb. before going to the batten press which packs them in bales, four bales forming one ton. The board at present planned will range up to 20 gauge or some 0.056 inches in thickness.

Board thicker than this must be made by pasting two or more sheets together with silicate of soda and it is the ultimate aim of the factory to make whatever thickness of sheets the trade demands, although at the start only the thinner sheets of the highest possible quality will be the goal. Plenty of room is available for the installation of this and other machines which the company has in mind.

As to the powerplant, the board machine's constant speed parts are driven from the main shaft, about 80 horse-power being used for the four stock pumps, two screens and other pumps. The variable speed part of the mill which requires about 100 horse-power, is driven by a Brownell (Dayton, Ohio) twin-cylinder engine with special governor which permits changes in speed in the ratio of one to six. Speed varying devices are used to drive the dryers, presses, calendars, reels and cutters at their proper pace. The main powerplant has one 340 b.h.p. Allis Chalmers simple Corliss engine of the drop valve type, with a 10-foot flywheel. The crankshaft of this is connected through flexible coupling directly to the main line of shafting which drives the beaters and other extra heavy machinery, thus dispensing with much belting losses that would normally occur. A special pulley attached to the engine crankshaft also drives the shaft carrying power to the constant speed part of the board machine.

The reinforced concrete stack that serves the boilers is planned to meet probable future requirements and is 130-ft. high by 6-ft. in diameter. It was built from designs by the Truscon company which supplied the material in large part. The stack sets on a foundation 26-ft. square. One of the prime requisites for a strawboard mill is an ample supply of water instantly available in every part of the mill and is insured by a reinforced concrete tank elevated 60-ft. from the ground. It is 20-ft. in diameter at the base and the tank proper is 14-ft. in diameter by 10-ft. deep. The

water supply is pumped through a line of 12-in. concrete pipe from the river and is elevated to the tank by a 6-in. Worthington pump whence it is distributed under 60-ft. head throughout the plant.

The works will have its own lighting plant which has been purchased from the Ridgway Dynamo & Engine Company of Ridgway, Pa. This not only lights the plant but furnishes power for the machine shops and packing press. The set is a 25 kilowatt one furnishing current at 125 volts direct current. The company has provided against breakage or wearing down of small parts by installing a pattern shop, foundry and machine shop so that any ordinary repairs and renewals can be taken in hand without expensive waits for parts to come from Shanghai or America.

Wah Chang Strawboard Mill at Soochow

The only strawboard mill now operating in central China is that of a Chinese company at Soochow whose success has led to the formation of the Wah Chang Strawboard Company which proposes to put in a 20-ton mill in the Japanese concession where a site already has been purchased and contracts for machinery are being considered. The mill now in operation is located more than a mile outside the city wall and is on the banks of the Soochow creek from which it draws its water supply. The site is 20 *mow* or slightly over three acres on much of which the straw is stored in the open in huge piles. The buildings are of brick and concrete with tile roofs in the main although part of the roofs are of wood.

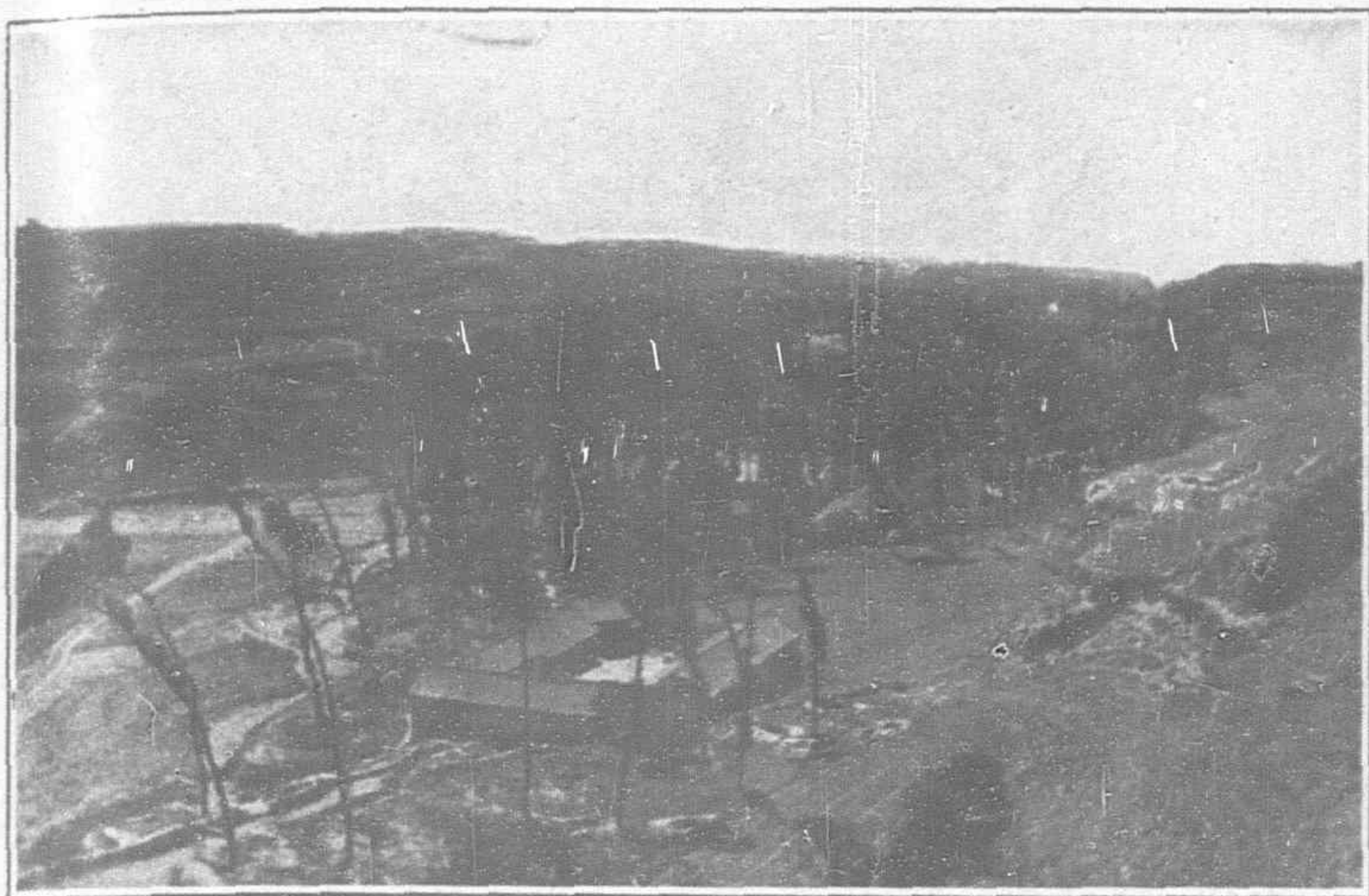
With its present equipment, the mill consumes approximately 18 tons of straw a day from which some 12 tons of strawboard is produced each 24 hours, but by crowding the equipment somewhat, it is asserted that 14 tons a day can be made. A new cooker of fifteen feet diameter is to be installed to raise the output of the plant to approximately 20 tons. The mill has a 200 horse-power engine of American manufacture and two boilers of the Scotch marine type which were purchased in Shanghai. The paper machine and most of the other equipment is of Japanese manufacture.

The mill has two straw cutters which reduce the material to three inches lengths and discharge into a small pit from which the straw is elevated by a home-made lift consisting of a belt with wooden strips bolted on. This takes the straw to the floor above the cookers which are 13-ft. in diameter and of the Globe rotary type. The cookers are mounted on masonry foundations seven feet above the floor level and discharge into a concrete sump in which is an inclined cylindrical screen where a preliminary washing is given the cooked pulp which is then elevated by a device consisting of metal strips mounted on two chains to the three beaters ten feet above the main floor level. The beater tubs are 14-ft. long by eight feet wide and three and one-half feet deep. Each has one beating cylinder equipped with knives and two washing cylinders. The beaters discharge into wooden chutes which lead directly to the two stock chests where the pulp is agitated by power-driven stirrers. These stock chests are of concrete, ten feet in diameter by nine feet high having on the outside of each single vertical stock pumps, power driven, which pump the stock to two small Jordan engines from which the stock is discharged into concrete stock chests similar to those above each with its own agitator and pump which sends the stock up some 15-ft. to a distributing box from which it is fed to the vibrating screens at the wet end of the paper machine.

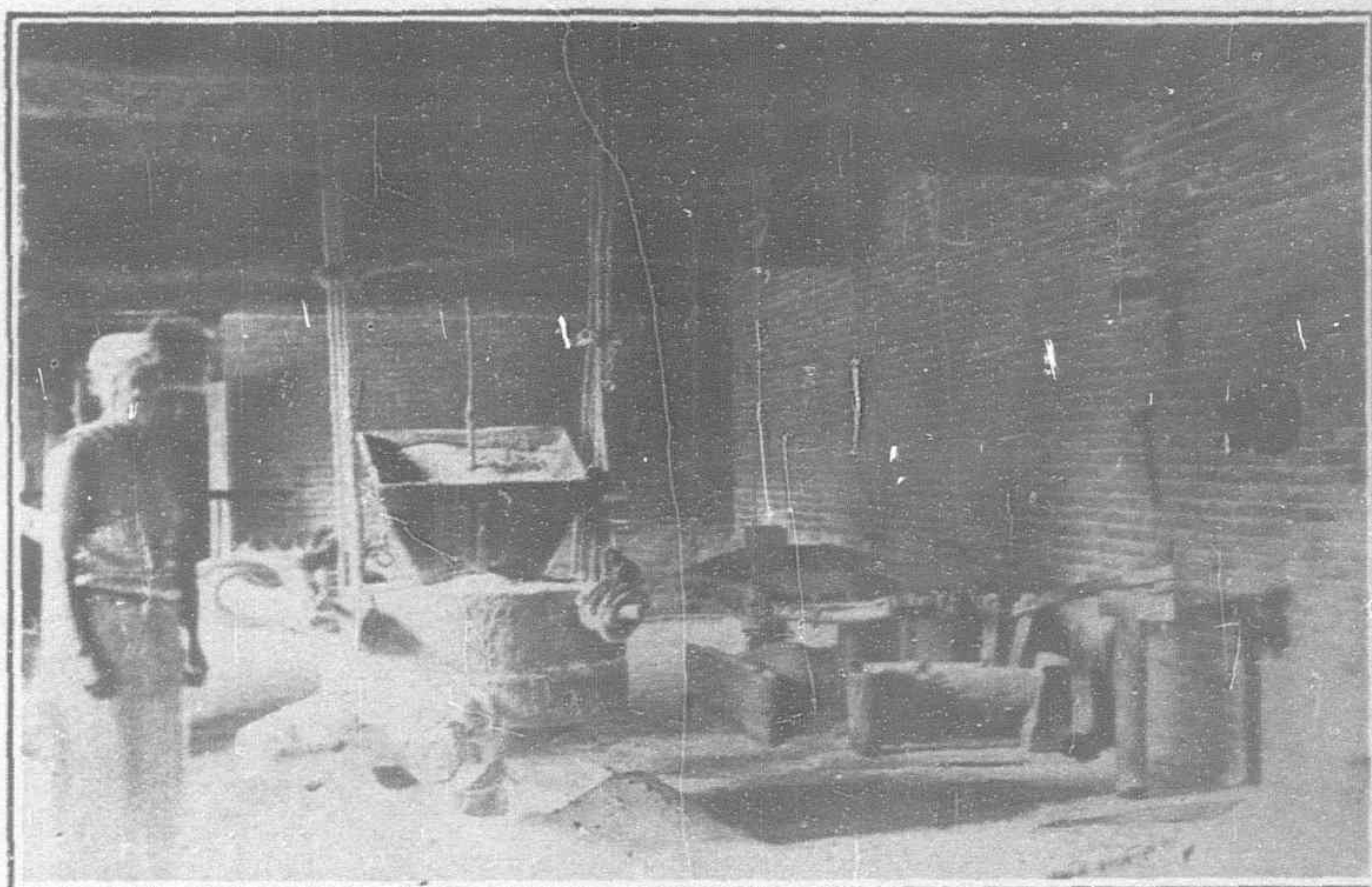
These vibrating screens discharge into the cylinder chest where the pulp is picked up on four revolving cylinders by means of a traveling felt which passes through rolls that squeeze out as much of the water as practicable after which the pulp passes to the drying rolls, 26 in number, about 36-in. in diameter with width sufficient to produce a sheet 72-in. wide. These rolls are served by a traveling canvas to support the film of paper through the lower tier of rolls. The dried cardboard then goes to the six-roll calendar and thence to the slitting and cutting machine which turns out sheets about 20 by 36-in. and trims the edges of the sheets. The sheets are tested as to weight on a small hand scale from time to time and then pass to the packers.

The main power plant consists of two boilers of the Scotch marine type approximately 30-ft. long by 13-ft. in diameter, made in Shanghai. One 200 horse-power cross compound Corliss engine, said to be of American manufacture, was used for driving the main

(Continued on page 511.)



Chinese Water Power Flour Mill.—Exterior View.—Located in the Yu Tao Ho Valley, near Fenchowfu, three days ride by cart, beyond Taiyuanfu, Shansi Province



Chinese Water Power Flour Mill.—Interior View showing the primitive stone mill and sifting apparatus described in the accompanying article

TYPES OF NATIVE CHINESE FLOUR MILLS

Wheat Flour Mills of China

By G. D. Woodyard

Note.—The following account of flour mills and flour milling in China, written by Mr. G. D. Woodyard, engineer for Fobes Company, Limited, is remarkable for the sharp contrasts it draws between the ancient Chinese methods, substantially those used in Ninevah when the Tower of Babel was being built, and the enormous advance in milling practice that has come about since the first modern American flour mill was placed in operation.

THE foreign community of China and especially the American colony will recall the genial, lovable personality of Mr. A. S. Fobes who died a few years ago after a plucky uphill fight to retrieve a fortune that had been shattered through no fault of his own after he had retired to enjoy a well earned rest from fifty years of business activities in China. How cheerfully he faced his misfortunes and "came back" in the business world, stands as an example of sheer pluck that many younger men may envy. Mr. Fobes was one of the earliest pioneers of the American colony of Shanghai, arriving here in 1863 on the old clipper ship "St. Paul," after a voyage of 165 days from New York. In the following year he opened the "Heng-fung" hong next door to the old American consulate in Whangpoo Road. Some time during the early nineties the first roller process flour mills were brought to China by Fobes & Co. Mr. Fobes was quick to see the wonderful possibilities in the development of the wheat flour industry and determined to specialize in this particular line of engineering, a policy which has enabled his firm to arrive at the enviable position of having erected more flour mills units in this country than all other competitors combined. The experience of Fobes & Company in this particular industry is an added argument which strengthens the growing sentiment that only by specialization in engineering matters can lasting success be obtained in this vast and complicated market.

In the year 1918, an agreement was made whereby this firm became the exclusive agents for China and Manchuria of Nordyke & Marmon Company, of Indianapolis, Ind., one of America's leading flour mill builders; since when the firm has installed 33 complete flour mill units of all sizes and capacities of that company's manu-

facture. These mills have been erected in various towns in the length and breadth of China, from Shanghai to the north as far as Tsi-tsi-har in north Manchuria, in the heart of the "Hung Hutze" (Red Beard) bandit country, and west as far as Tai-yuan-fu, in Shansi province. The illustrations to this article will serve to give an idea of the exterior and interior views of some of these mills.

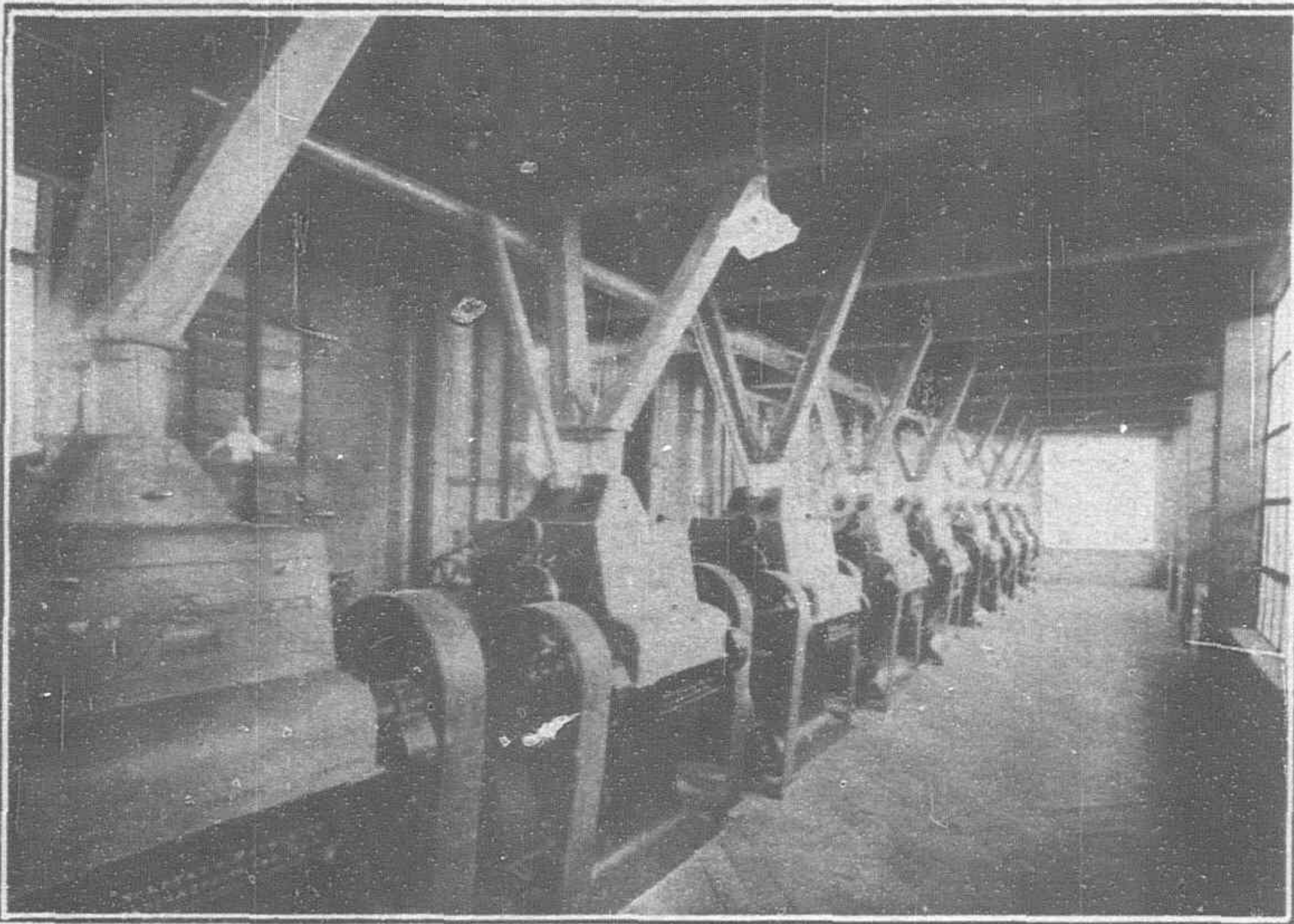
Ancient Milling Methods

Although the Chinese are among the oldest people in the world to be familiar with the use of flour ground from wheat and corn, until approximately 25 years ago only the most primitive mills were used in this country. The illustrations will give an idea of the several methods used in this crude native system. Probably one of the most ancient is the "mortar and pestle" sort of arrangement, where the grain is poured into a groove or hollowed out place in the lower rock, and the circular grinding rock moved back and forth by means of a handle, fastened by a pivot-like arrangement shown in the foreground. Before grinding, the grain is roughly cleaned by use of a hand sieve or by winnowing, to remove the chaff, straw, bitter tasting cockle seed, wild peas, stones, sand and other foreign materials detrimental to the taste and color of the flour. In the interior, nearly every village possesses one or more stone mills of one of the types illustrated, by means of which they have ground their flour as needed, for generations.

The Chinese flour mill driven by water power, located in the Yü Tao Ho valley, three days ride by cart beyond Tai-yuan-fu, Shensi province, shows what was probably the highest type of Chinese flour mill in use before the coming of the modern American roller mill. This mill represents a marvel of primitive ingenuity, being constructed entirely of stone, wood and



The Late A. S. Fobes, Pioneer in Modern Flour Mill Practice in China

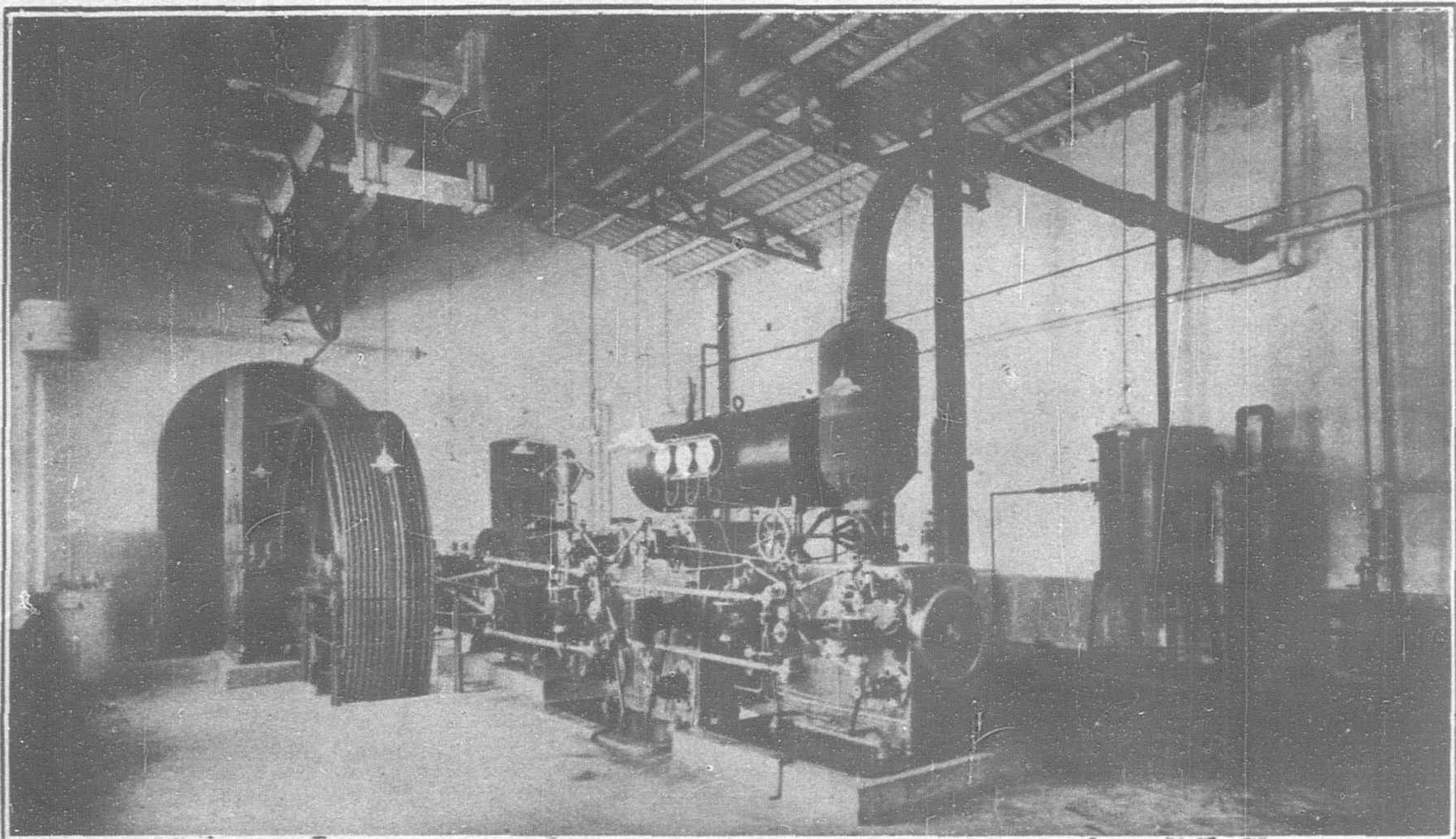


2nd Floor

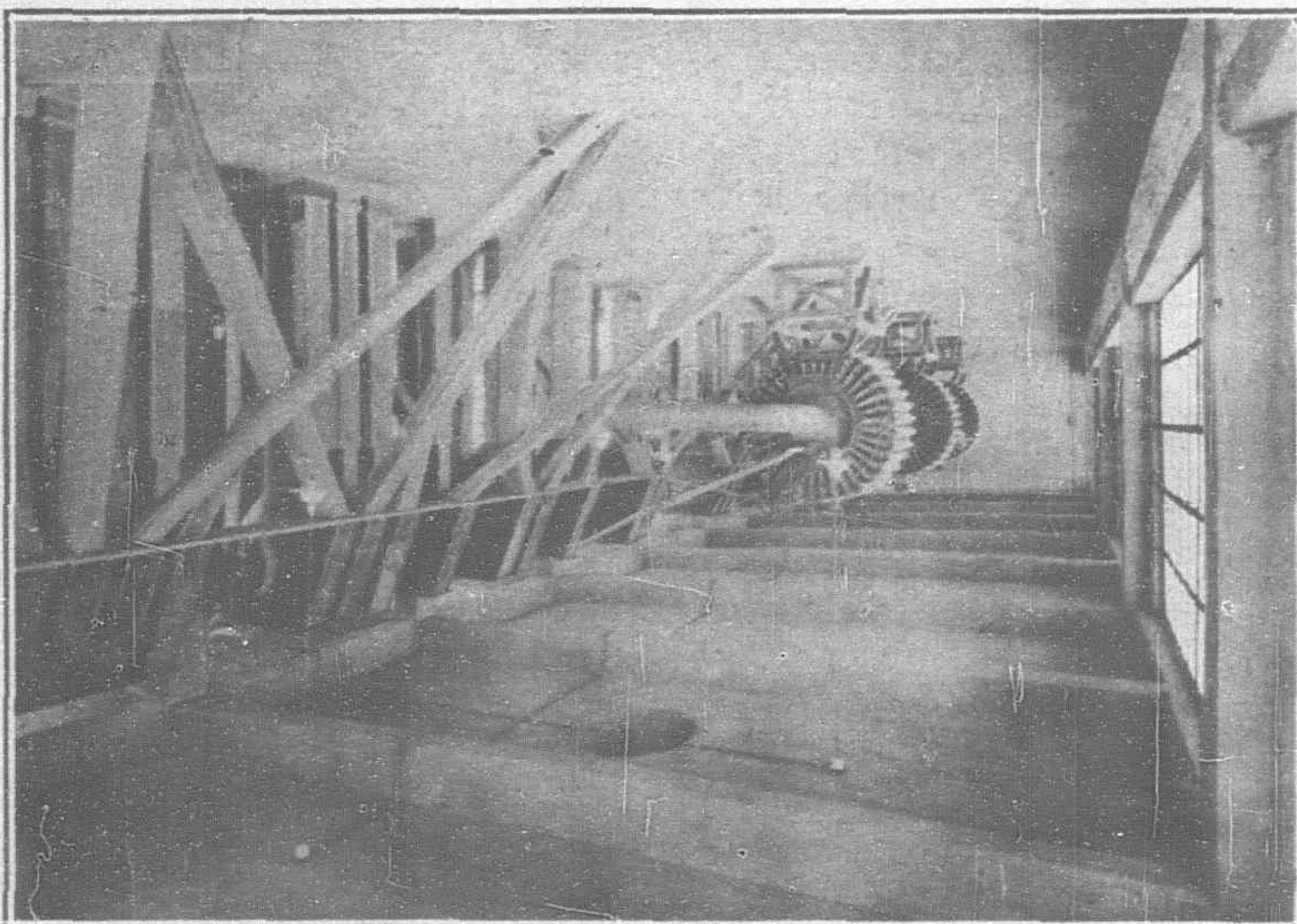


3rd Floor

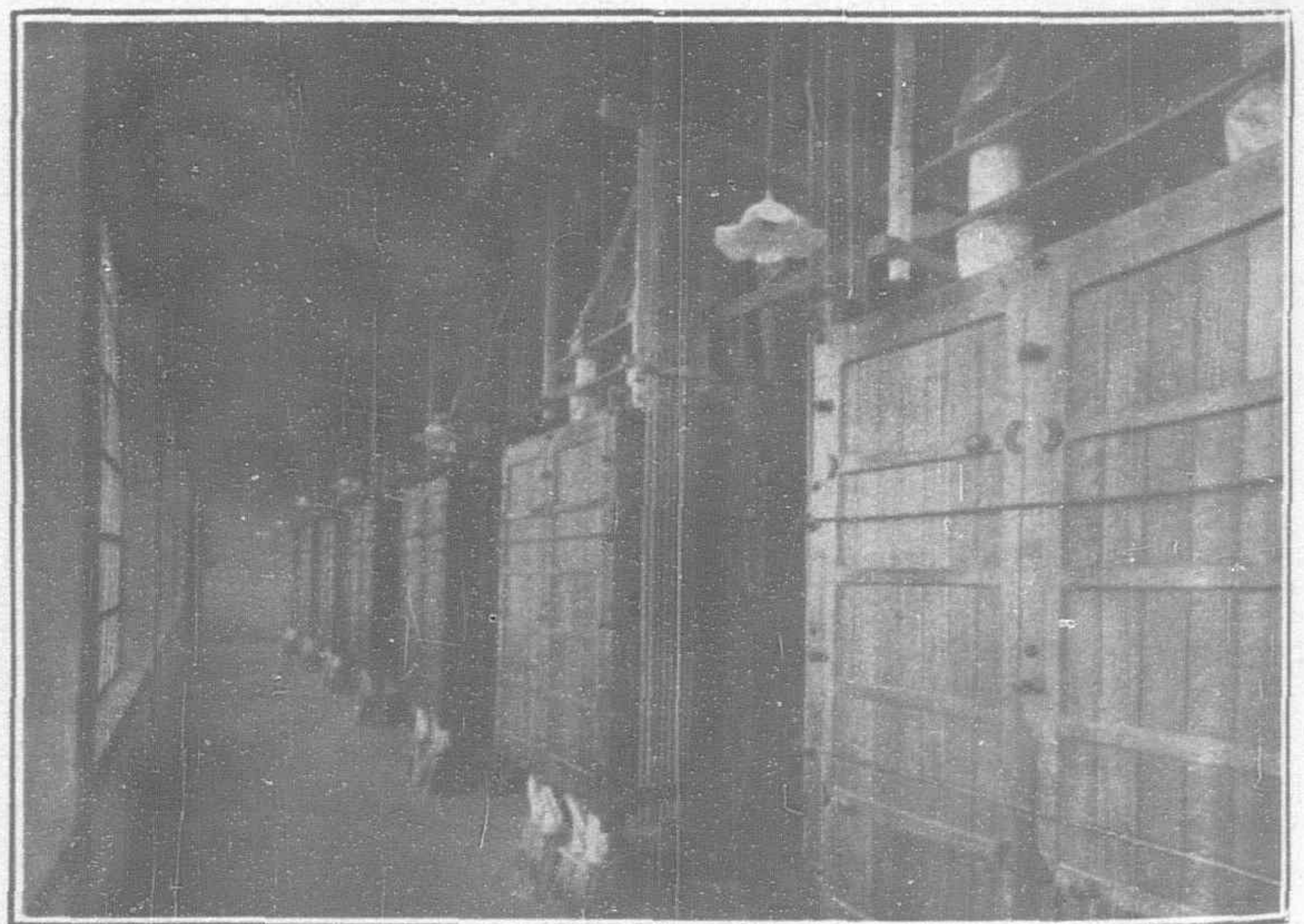
ropes, without a nail, screw or bolt in the whole outfit. The grinding stones approximately 4 feet in diameter were hewn from a native quarry nearby. The upper stone is stationary kept from turning by the large wooden post at the left. The grain is admitted through a circular opening in the centre of this stone. The square hopper



shown sits above this opening. The miller controls the grinding, fine or coarse, by lowering or raising the wooden binding pieces on the ropes by which the upper stone is hung from the ceiling rafters. The lower grinding stone revolves. It is mounted on the two cross beams shown, which in turn are fixed on a vertical wooden shaft con-



5th Floor

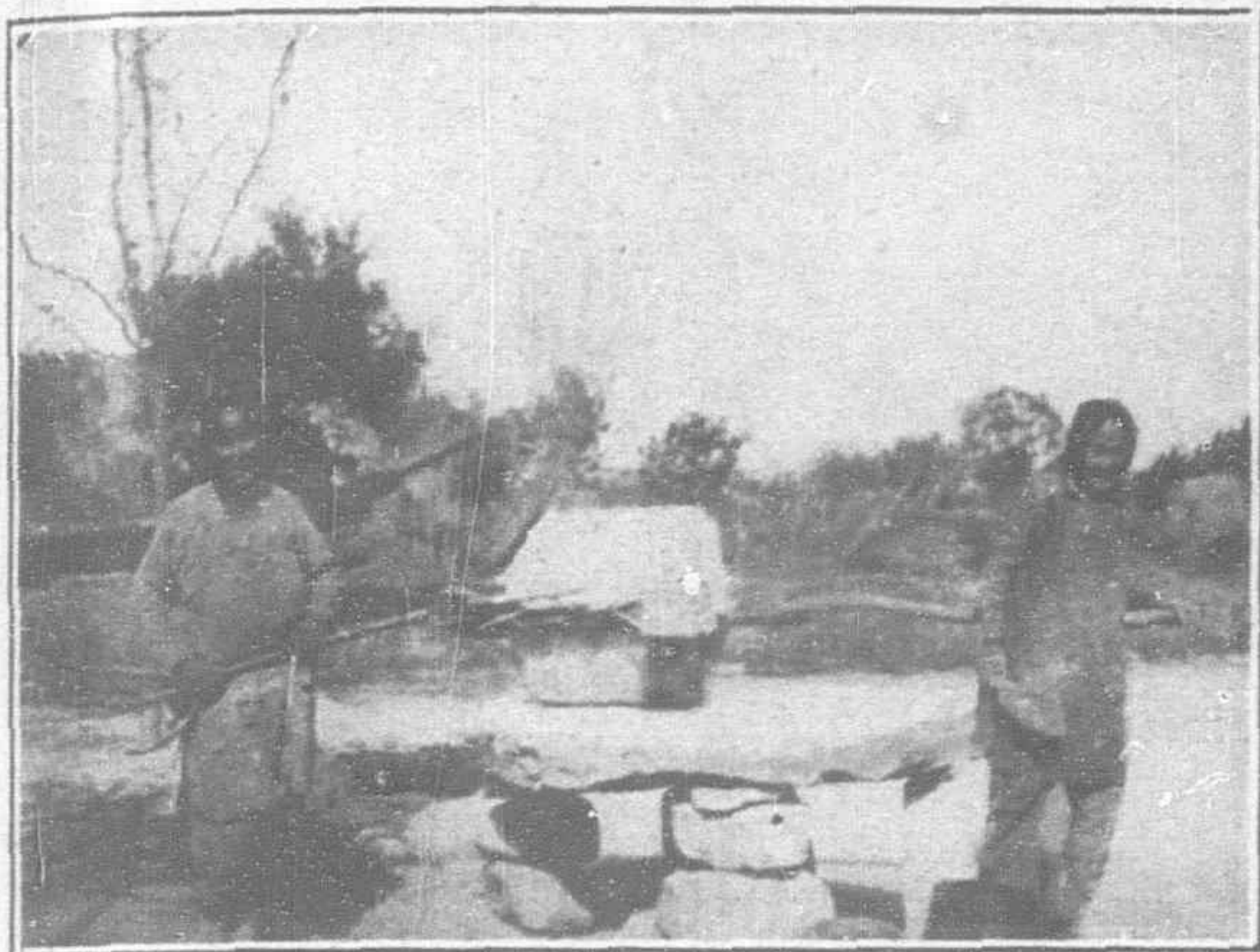


6th Floor

Interior Views of the New Fu Hsing Floor Mill at Tientsin. An Exterior View of this Mill is shown on Page 505

2nd Floor: Showing one of the two files of the latest Double Roller Mills on the Grinding Floor, equipped with all metal housing, stream splitters, glass sight tubes and a new type of self-aligning sleeve bearings. **3rd Floor:** Showing Bran Dusters, Purifiers and Spouting. **5th Floor:** Showing "Square Sifters." **6th Floor:** Elevator Discharges and Dust Collectors. **Centre:** Power Room equipped with 600 h.p. Tandem Corliss engine manufactured by the Murray Iron Works, Burlington, Iowa. Fobes & Company have installed more than twenty similar complete steam power plants in various parts of China. Although the mill building adjoining this power plant was completely destroyed by fire in 1922, due to a double fire wall and a fireproof roof, this power plant escaped damage and is now driving the new mill.

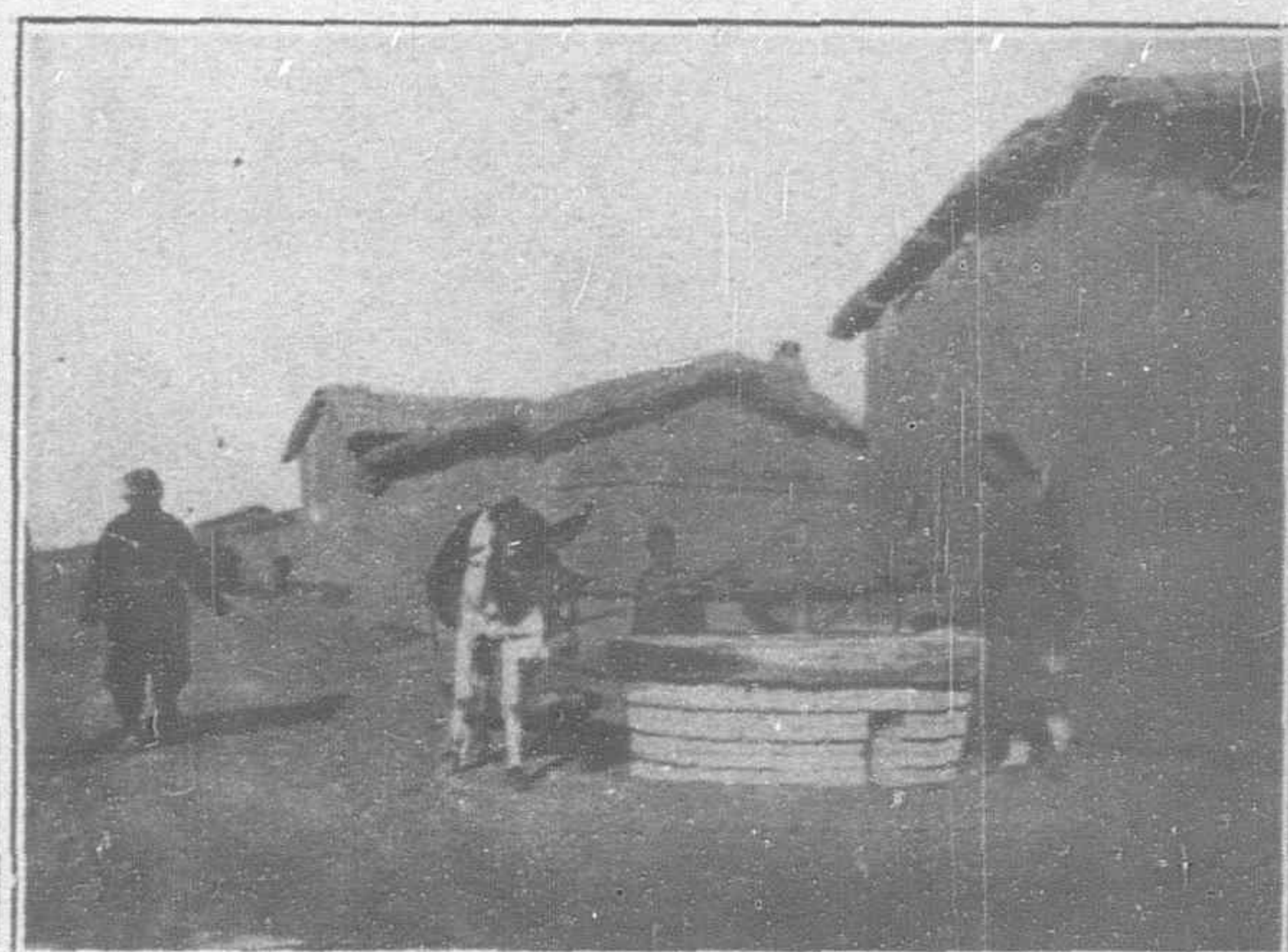
needed below by means of crude wooden gears (or spokes) to the water wheel. The upright post or vertical shaft at the right is similarly connected to the water wheel, and by means of the crude arrangement shown in the foreground, to the right, shakes the sifting sieve back and



Hand Power—Village Stone Mill



Primitive "Mortar and Pestle" Mill



Village Stone Mill turned by Donkey

forth. The arrangement for keeping the meshes of the cloth from clogging is simplicity itself. The sieve is hung so that it knocks against the square post at the rear at every swing. The bolting cloth, unlike the wonderful and expensive silk bolting cloth used in modern mills, is made of horsehair. The Chinese are very clever in the making of this horsehair bolting cloth and obtain a uniformity in the mesh that is really remarkable.

The ground product from the stones falls to the floor, and as soon as enough has accumulated, is scooped up and dumped into the sifter at the right. The sifted and finished product again falls to the floor and either lies there until needed, or, if during the busy season, with plenty of grain to grind and water available to move the water wheel, the flour is scooped up and placed in tall earthenware jars or in bags.

The flour produced in such primitive installations may not be as white as that manufactured in up-to-date roller mills—it is coarser and necessarily darker in color and too often will contain small bits of the grinding stones, as well as fine ground rock and other

full of specks. As a rule, the product made by these old-fashioned stone mills is called "whole wheat" or "Graham flour." This type of flour was more popular with our grandfathers than with the present generation, although every once in a while nearly everyone gets a hankering for "Graham muffins."

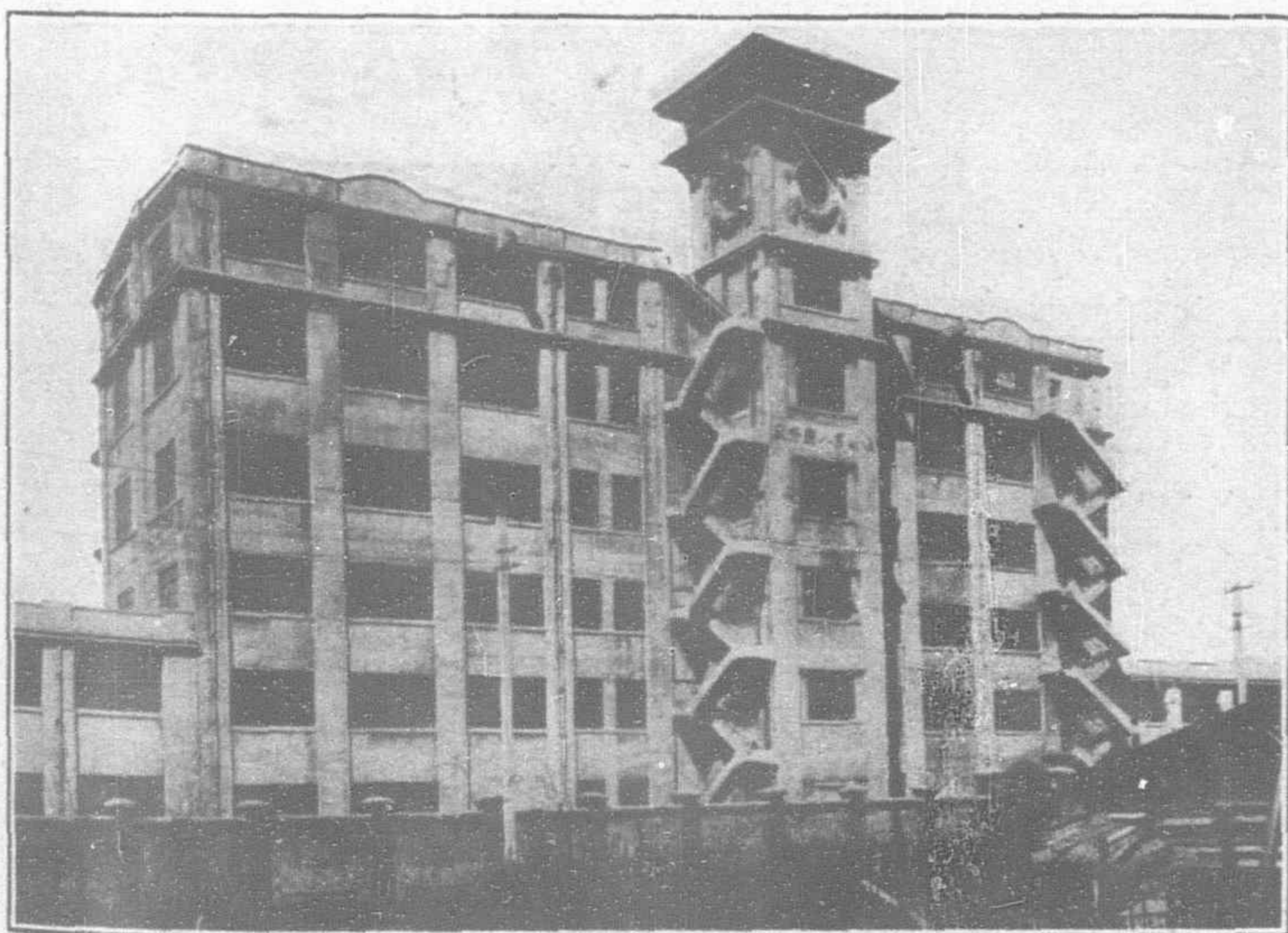
However, whole wheat flour can be made just as well, if not better, in the modern roller mill and under perfect hygienic conditions. While in China there are literally thousands of these stone mills, in their many forms still in operation, and their use here will probably be prolonged for many years yet, due to China's cheap labor, nevertheless, with the coming of the modern roller mill, with its clean, scientific and efficient system, these primitive, though picturesque, mills will be obliged to go out of business.

Modern Practice

In contrast to the above methods are the many fine new mills equipped with the modern American roller process of flour mill machinery. Thirty-three of these modern mills are operated by machinery manufactured by Nordyke & Marmon Company, of Indianapolis, Indiana, U. S. A., and installed by Fobes Company, Limited, are now at work in many of the principal towns and ports of China and Manchuria.

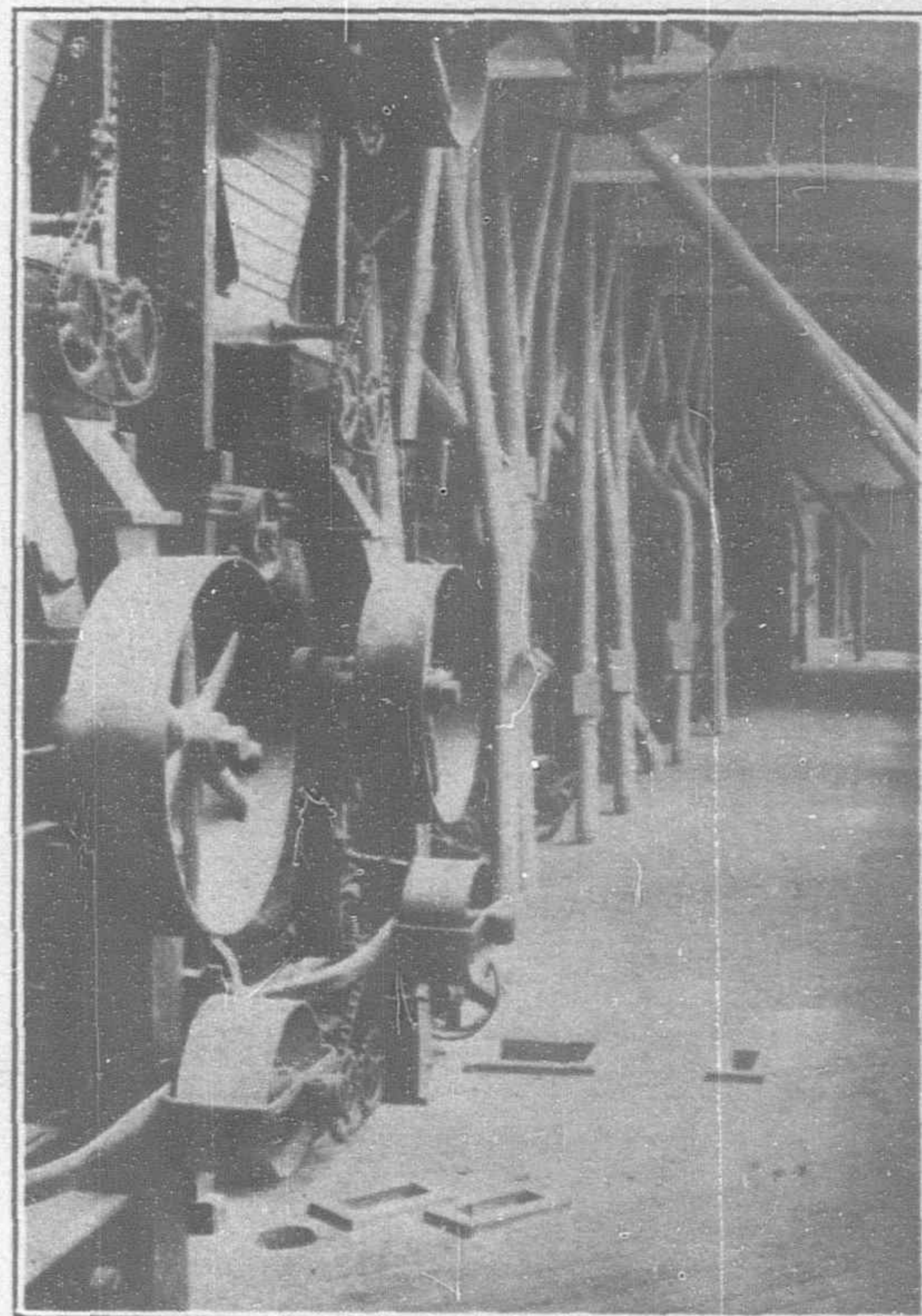
Foh Sing No. 8 Mill, Shanghai

Of the mills in South China, probably none represents a finer type than the Foh Sing No. 8, Mokanshan Road, Shanghai. Six storeys in height, built en-



FOH SING FLOOR MILL—MILL No. 8, Mokanshan Road, Shanghai

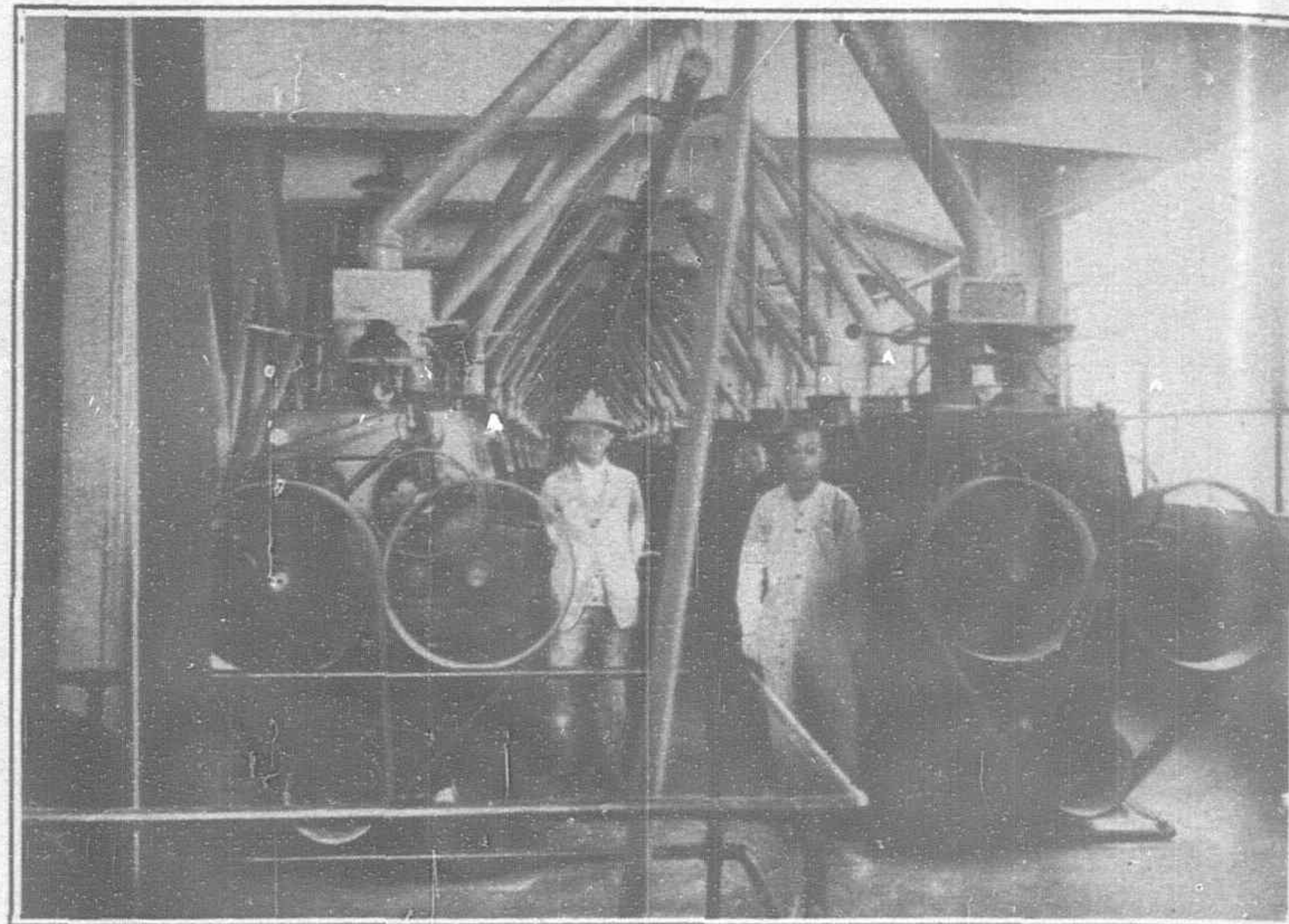
Capacity 14,000—50-lb. bags of wheat flour per day. Equipped with Nordyke & Marmon Co. milling machinery. Six stories in height, built entirely of reinforced concrete, of daylight construction, with all-metal elevators, spouting and wind trunking inside, together with a modern sprinkling system which is connected to the water tank concealed in the tower, this mill represents the last word in modern fire-proof flour mill construction. This mill is one of the largest as well as the finest in the Shanghai district. The interior views of this mill are on page 504



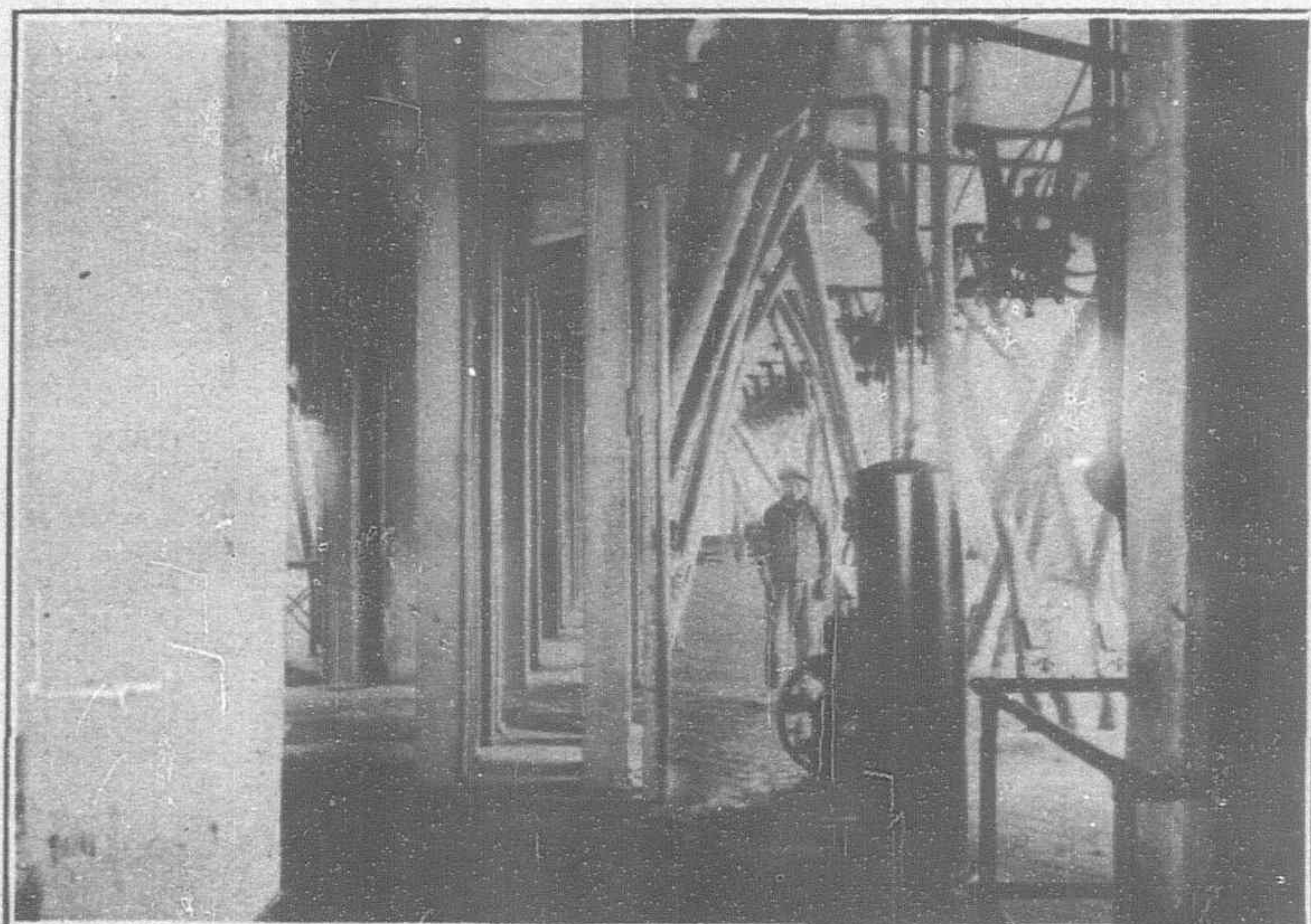
4th Floor of the Foh Sing No. 8 Flour Mill, Showing Purifiers and Reels, Views of the other Floors appear on opposite Page



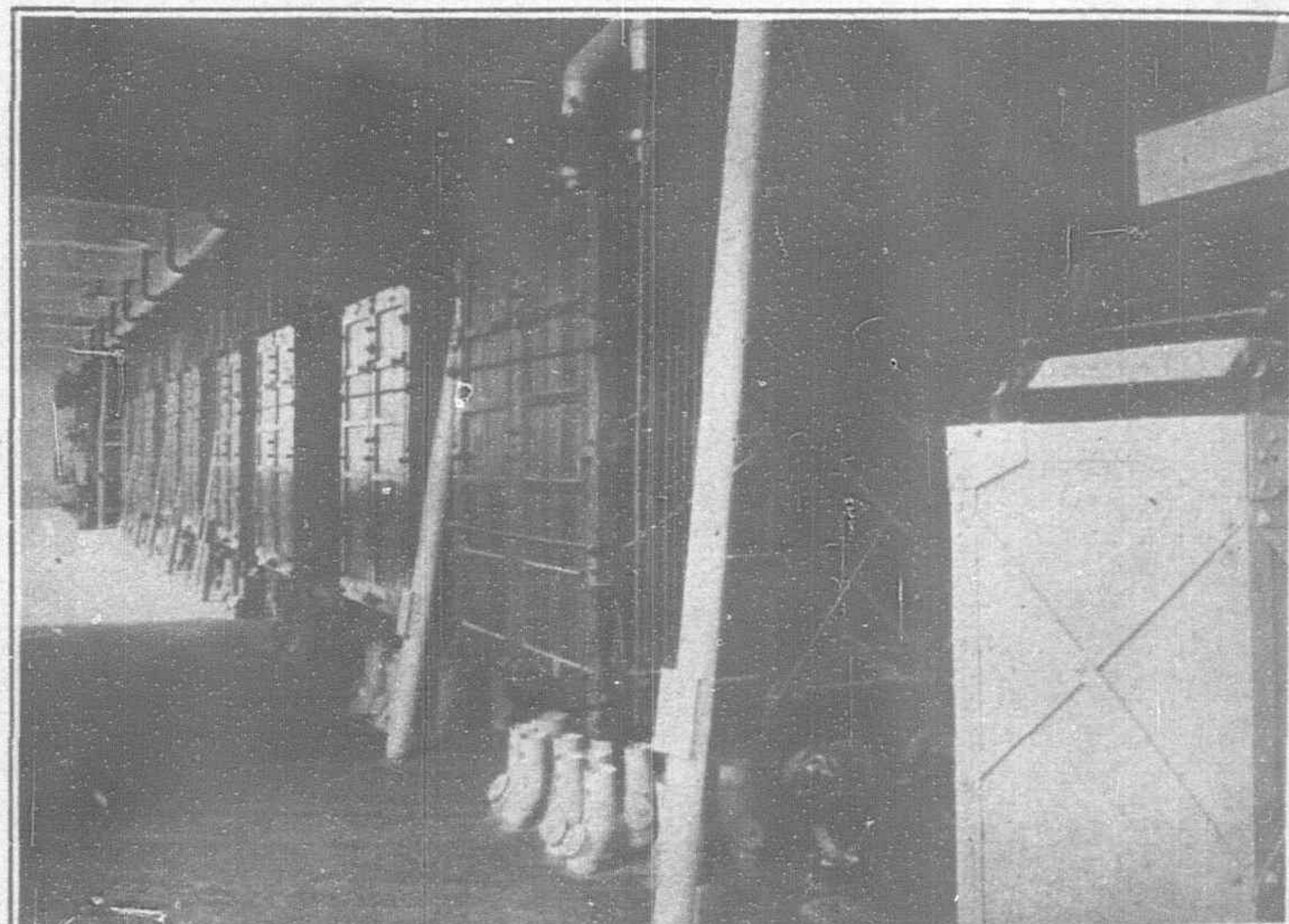
1st Floor: Automatic Packing Machines



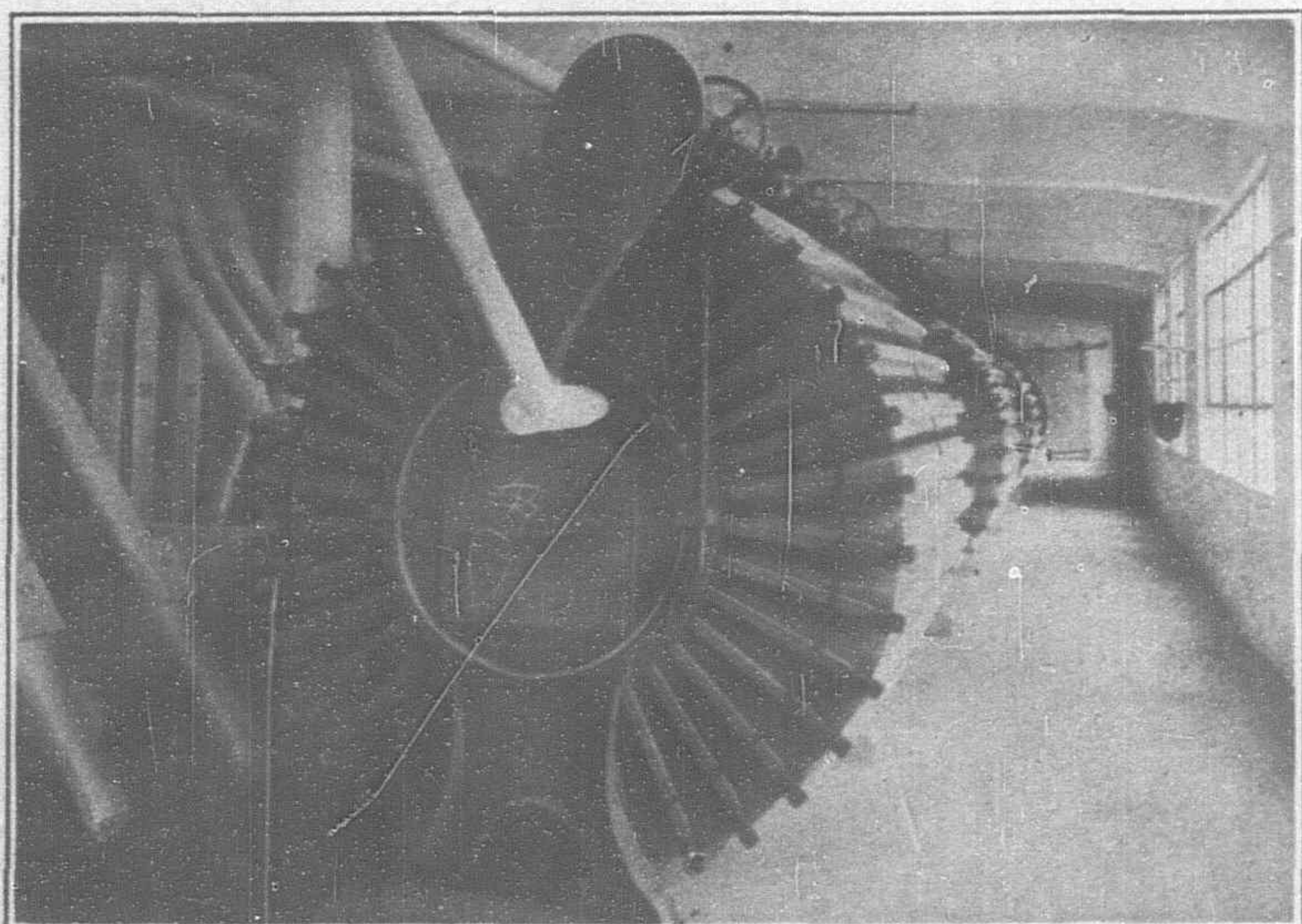
2nd Floor: Showing 28 Double Roller Mills on the Grinding Floor



3rd Floor: Spouting Floor



5th Floor: Sifting Machines and Reels



6th Floor: Showing Elevator Discharges and Dust Collectors

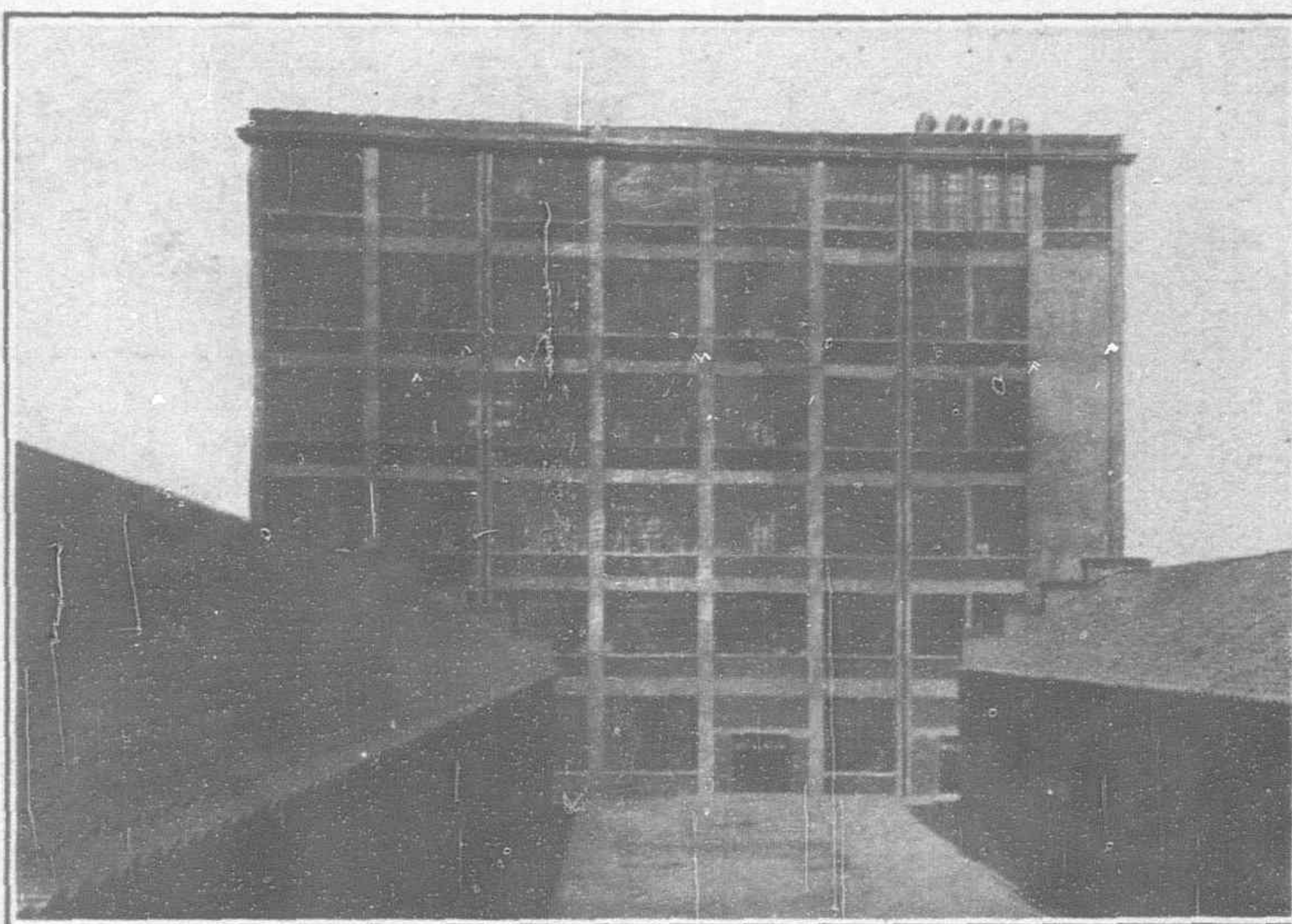


Motor Room: Showing 1-500 h.p. and 1-250 h.p. General Electric Motors direct connected to main line shafting. The larger motor drives the milling machinery, the smaller the cleaning machinery

Interior Views of "B" unit of the Foh Sing No. 8 Mill, Shanghai
There are two units "A" and "B"

tirely of reinforced concrete, of daylight construction, with all metal elevators, spouting and wind trunking inside, together with a modern sprinkling system which is connected to the water tank concealed in the tower, this mill represents the last word in modern fire-proof flour mill construction. This mill, one of the largest in the Shanghai district, is comprised of two independent units, both under the same roof, with a total output of 14,000—50-lb. bags of wheat flour per day. It is electrically driven, having one direct connected, 500 h.p. General Electric motor and one 250 h.p. motor for each unit of 7,000 bags.

The wheat cleaning department is separated from the milling department by a reinforced concrete fire wall and well, extending the full height of the building, with fire-proof doors



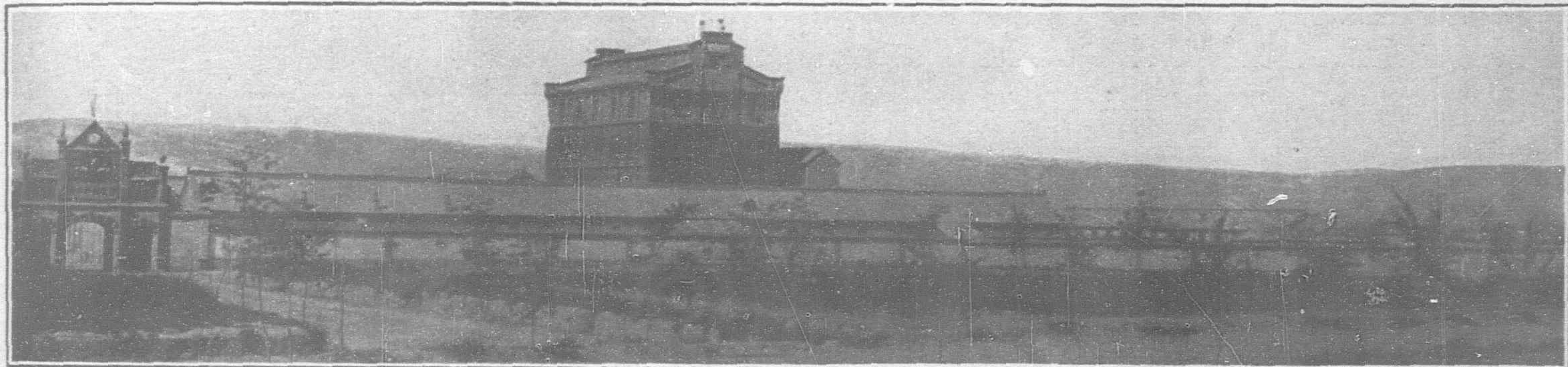
NEW FU HSING FLOUR MILL—TIENTSIN, NORTH CHINA

Capacity, 5,800—50-lb. bags of wheat per day. This fine new mill equipped with the latest American machinery was placed in operation in March of the present year and in it are embodied various modern improvements that are to be found in no other mill in China. Without a doubt this mill and its products can compare favorably with the best in any country. Interior views of this mill are shown on Page 502

The total output capacity of all of them is said to be in the neighborhood of 80,000—50-lb. bags per 24 hours. From the time this mill was constructed until a few months ago, this No. 8 mill was under the able supervision of an American mill expert, Mr. James Sanborn, but since his resignation it has been run by a native operator.

New Fu Hsing Mill, Tientsin

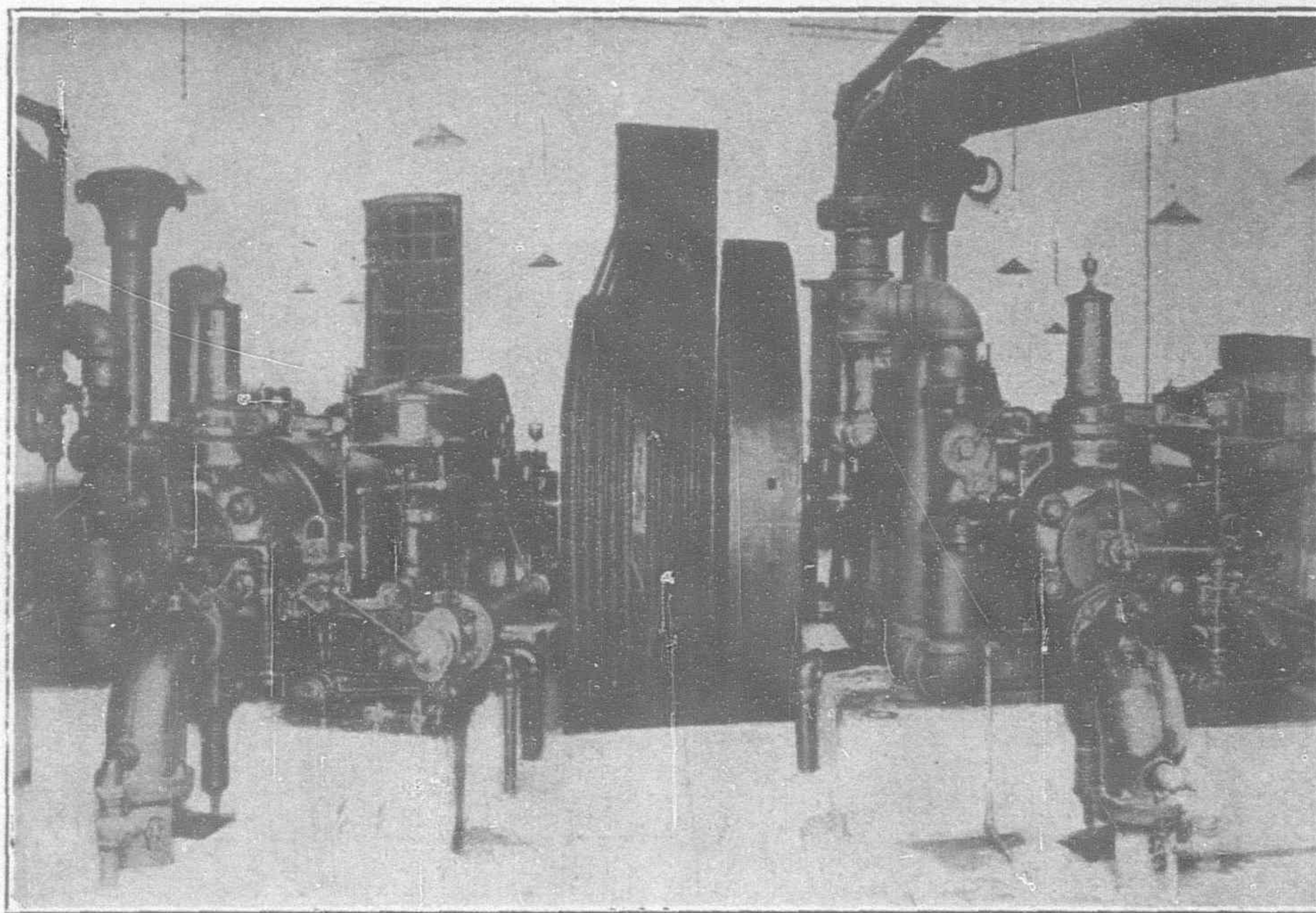
The first Fu Hsing Flour Mill, at Tientsin, North China, was built in 1919, and was equipped with Nordyke & Marmon Company machinery. It was located on the Yu Ho Canal, one of the branches of the Grand Canal. In fact, whenever possible, the Chinese always try to obtain a site located on a canal, to take full advantage of the cheap waterway transportation. The capacity of this first Fu Hsing Mill was 4,700 bags



The Ching Foong Flour Mill at Taiyuanfu, Shansi. Capacity, 1,500—50-lb. bags per 24 hour day

connecting, so that in case a fire should occur on any floor, it could be quickly isolated and put out. A modern service elevator, located in the well, gives the miller and his operatives quick access to any floor.

This mill is located on the Soochow creek and there are extensive godowns to take care of both wheat and flour, which are stored separately. Practically all of the wheat is delivered to the godowns by sampans or lighters and most deliveries of flour to Shanghai are by boat. This mill, as well as the 5,800 bag mill, "Mow Sing No. 2," at Wusih, is owned by the large flour mill combine managed by Mr. T. K. Yung. This company owns and operates 14 flour mills in this and the central part of North China.



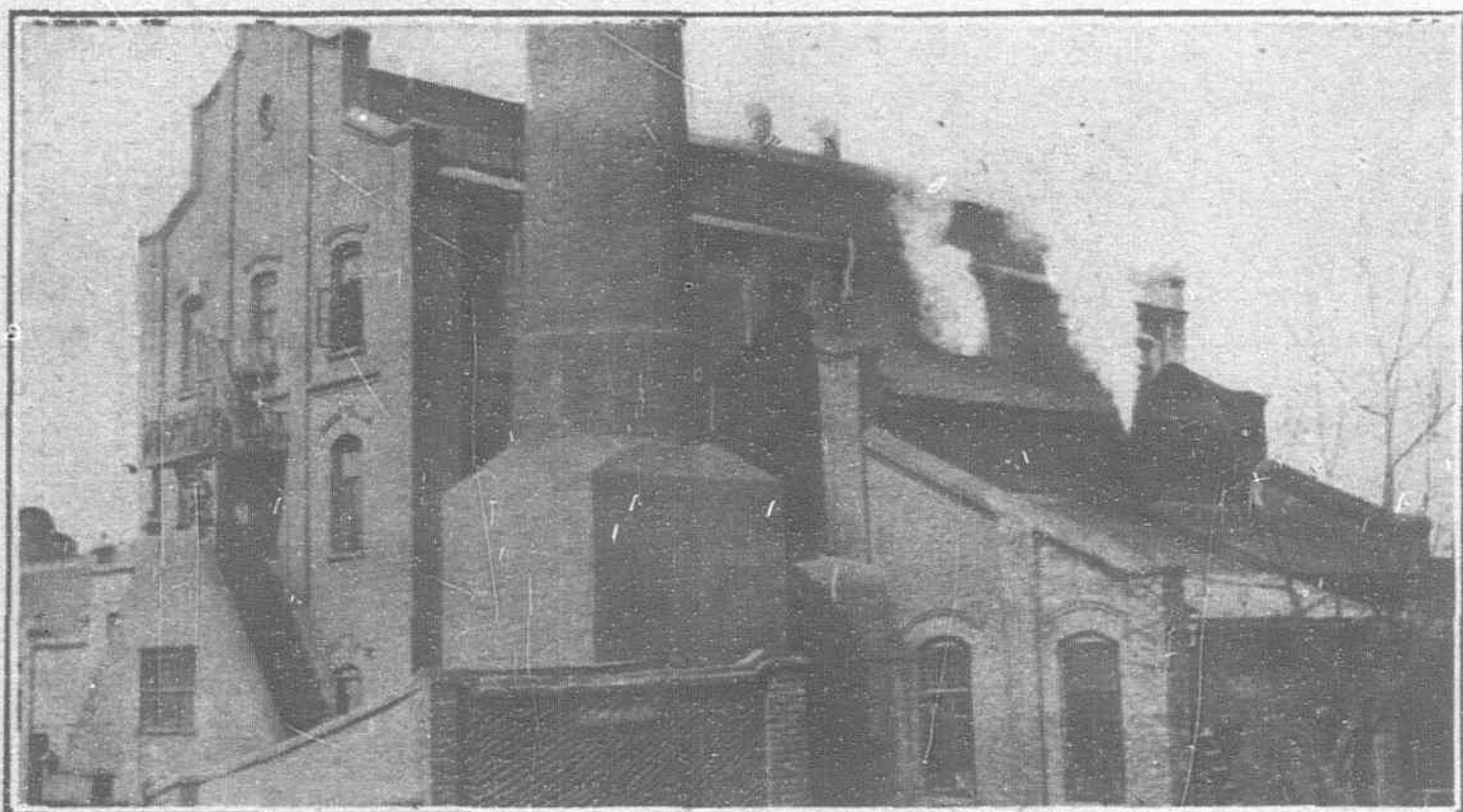
300 H.P. Twin Cylinder Otto Producer Gas Engine

CHING FOONG FLOUR MILL

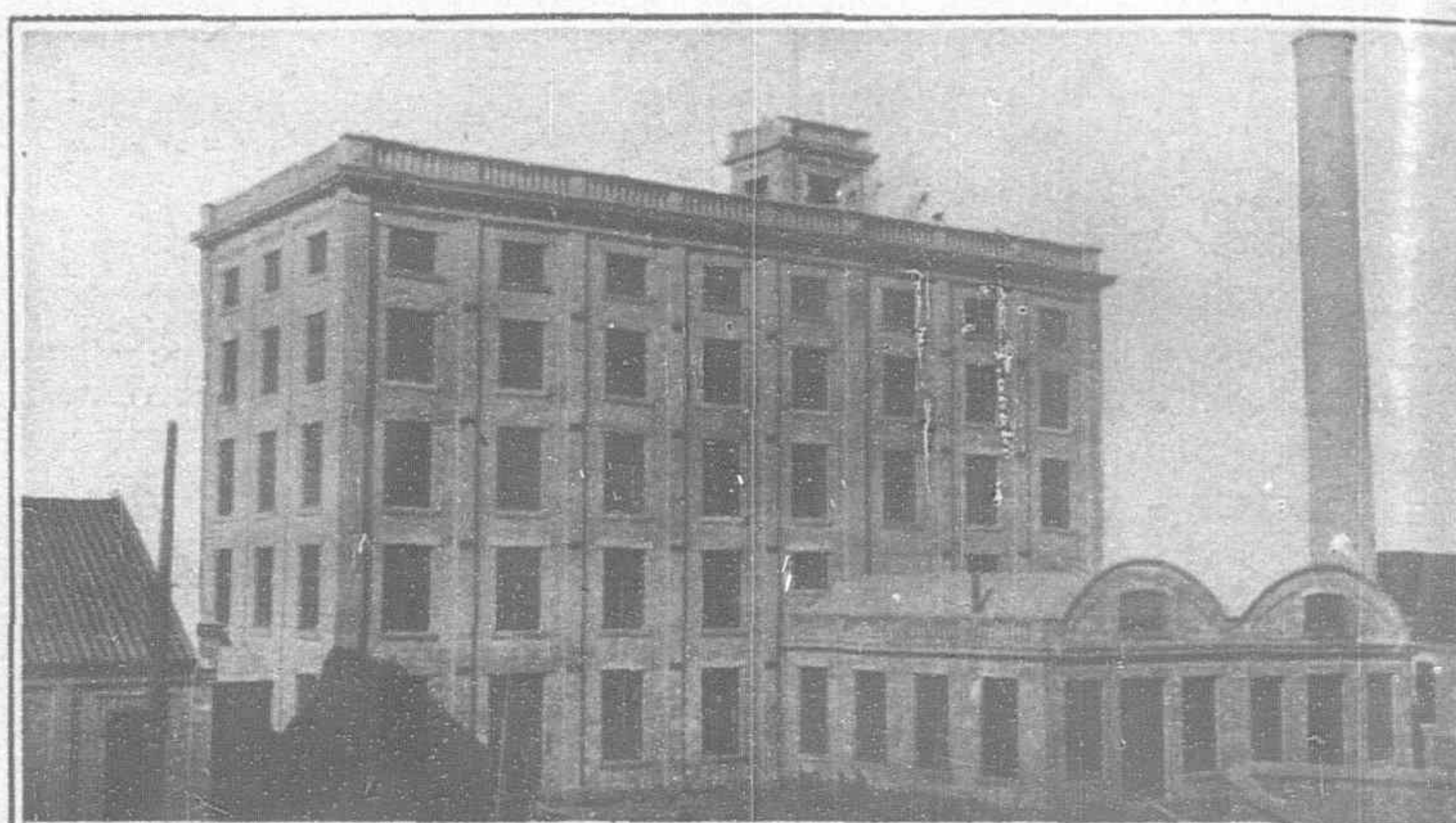
Taiyuanfu, Shansi Province

The above plant was manufactured by the Otto Engine Works of Philadelphia, Penn., and is among the first gas producer plants to be installed as a power plant of a flour mill in China. Although the initial cost of this type of plant is usually a little higher than that of a steam power plant, the fuel consumption is considerably less, and provided a plentiful supply of anthracite coal is available, a gas producer plant is to be preferred. The power plant of the above mill is comprised of the following equipment: 1—300 H.P. Twin Cylinder Producer Gas Engine; 1—No. 8 Gas Producer and Scrubber; 1—Gas Receiver; 1—No. 3 Auxilliary Engine and Accessories and 1—Curtis Compressor,

per day. It was successful from the outset, but in the winter of 1922 a disastrous fire completely gutted the mill building. Only the bare walls were left standing. The mill company was protected to a large extent by insurance. As it had had wonderful success new capital was quickly forthcoming for a new mill which was planned on a much larger scale to take care of the company's ever increasing business. The directors were so highly pleased with the results obtained from the Nordyke & Marmon equipment supplied for the first mill, that they chose the same class of machinery for the new mill, without a dissenting vote, but in this case Mr. Chang, the progressive and capable general manager of this company, gave Fobes



Tien Feng Flour Mill, Kaifengfu, Honan Province.
Capacity, 3,000—50-lb. bags per day

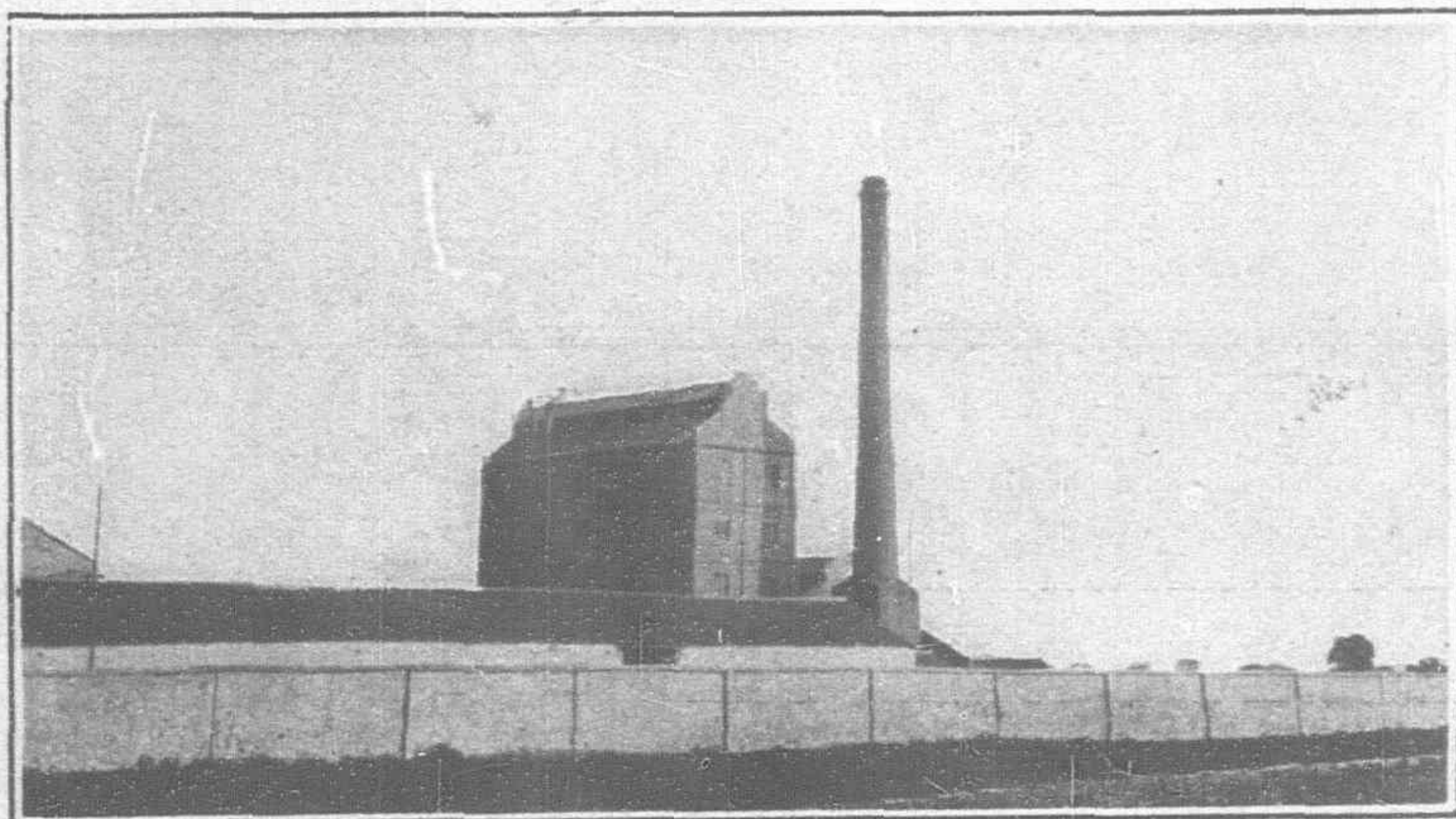


Ching Feng Flour Mill, Tientsin, Chihli Province
Capacity, 3,600—50-lb. bags per day

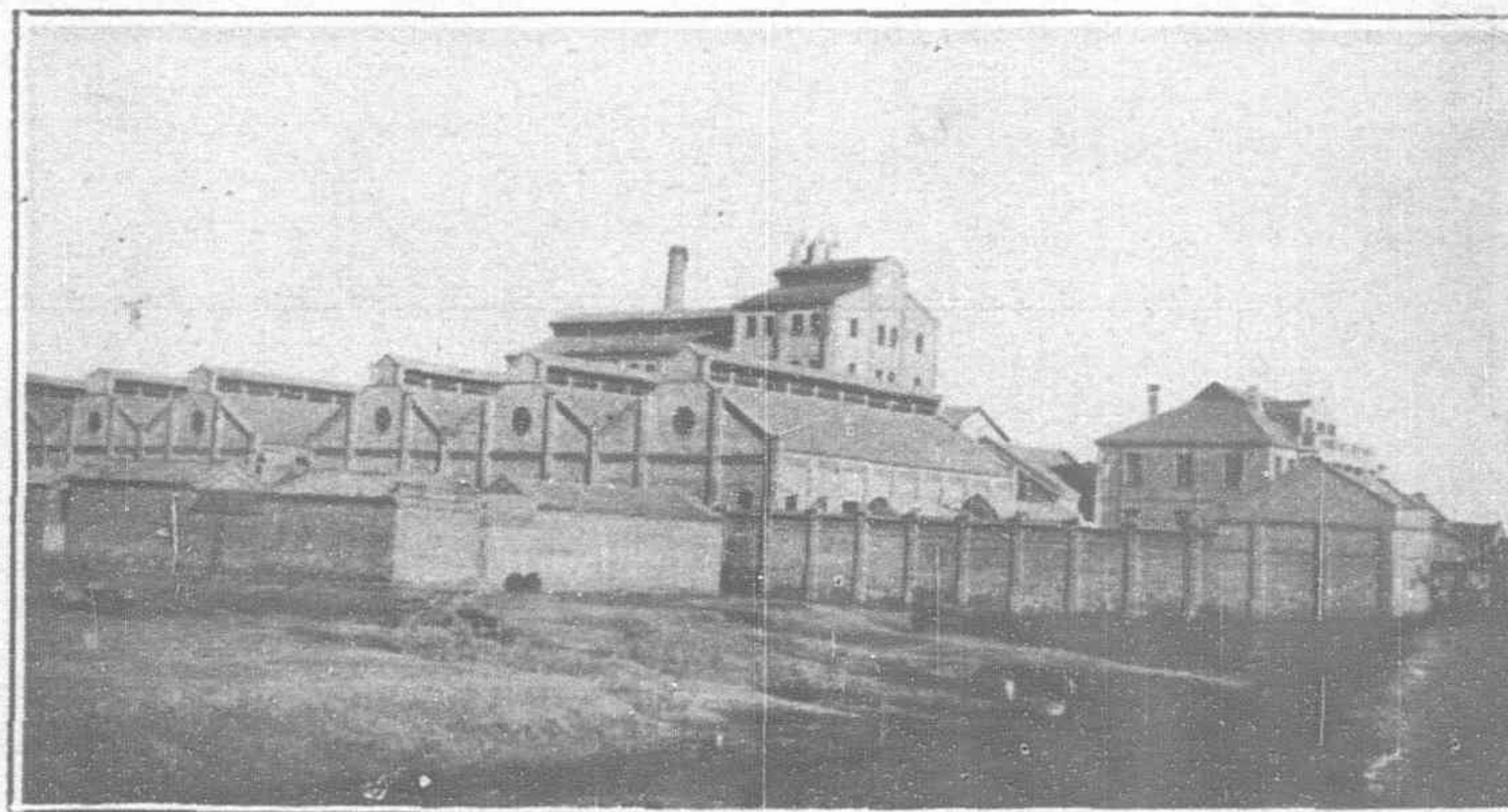
Company *carte blanche* to build the best mill possible.

Although the fire had completely destroyed the milling machinery of the old mill, it had been possible to save the 600 h.p. modern steam power plant, with its Murray Iron Works Tandem Corliss engine, and this excellent plant, after a few minor repairs, and the addition of McMillan automatic fuel saving furnaces, was used to drive the new mill which was erected on the old mill site. The mill building and godowns are in a compound surrounded by a high wall, but the illustrations will give a fair idea of its appearance. The six storey building is of reinforced concrete, daylight

trifier," which equipment has proved an unqualified success. Practically all flour manufactured in China has been unbleached, whereas nearly all of the flour imported from American mills is bleached. This mill was also one of the first to put in modern machinery for closing the filled flour bags by machine, as is the practice in most modern mills at home, instead of the old laborious and costly method of hand sewing, still in use in practically all Shanghai mills. By the installation of these two machines and a conveyor on the packing floor, the hire of 23 coolies on that floor was saved. On the packing floor in the old mill, the coolies had



Hung Foong Flour Mill, Changchow, Kiangsu Province.
Capacity, 3,000—50-lb. bags per day

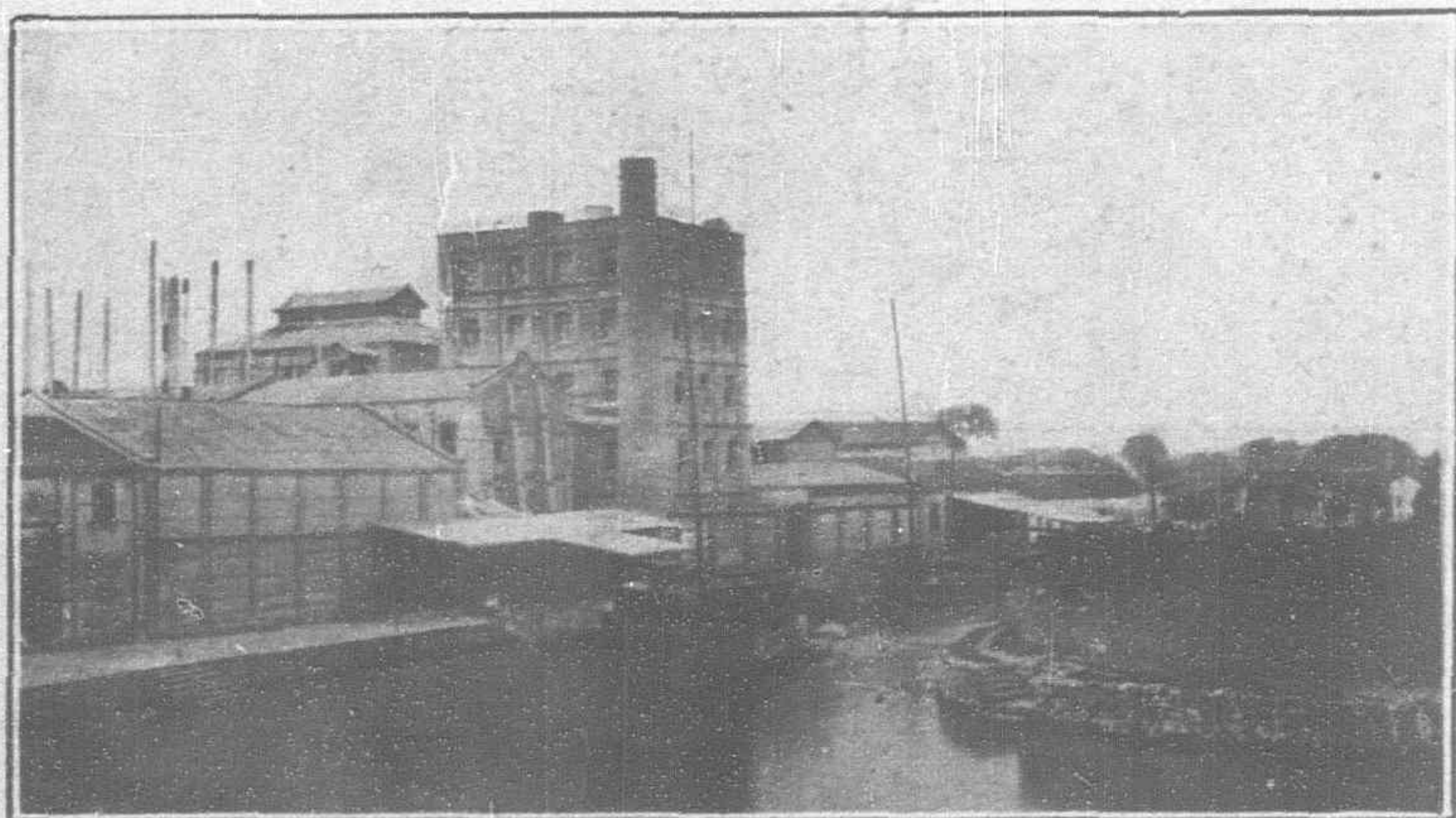


Ta Feng Flour Mill, Tientsin, Chihli Province.
Capacity, 6,200—50 lb. bags per day

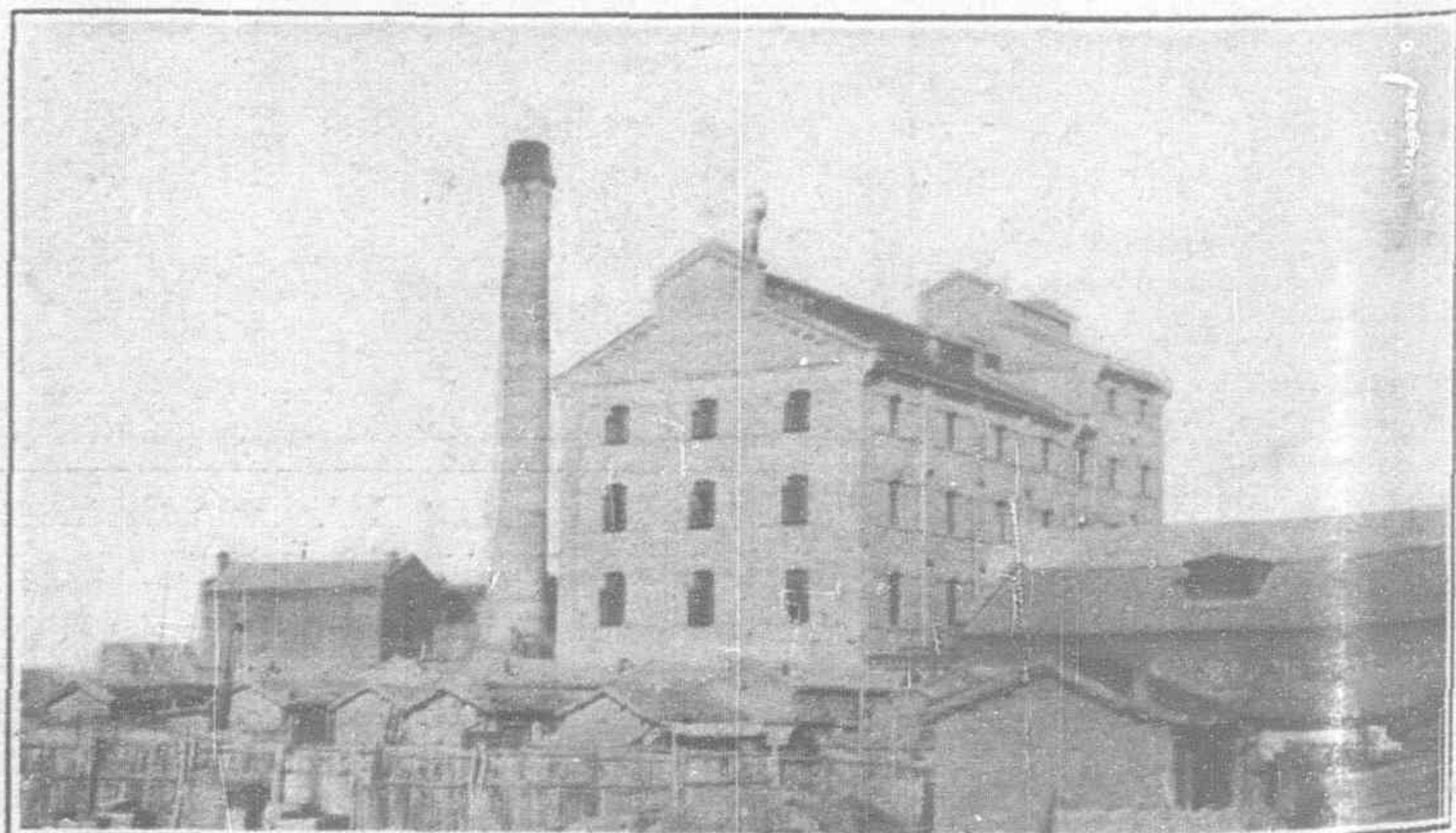
construction and is as near fire-proof as it is possible to make a flour mill building. A fire wall separates the milling department from the wheat cleaning department. The double roller mills are equipped with the latest type self-aligning sleeve bearings and all metal fire-proof housing, with glass tubes and stream splitters above. A very perfect dust collecting system insures an almost dustless mill throughout.

This mill was the first one in China to put in the Alsop electrical bleaching and ageing process with the new "Perfected Arc Elec-

been so numerous that they could hardly keep out of each other's way. The "Union Special" sewing machines which close these filled bags of flour are not only swift in operation, each machine being able to handle up to 200-50-lb. bags an hour, but the bags are closed with a double locked stitch that makes it extremely difficult for anyone to tamper with the contents. To illustrate the importance of this point, a bag of flour may pass through half a dozen middlemen before it reaches the ultimate consumer. If *hand sewn*, the contents of the bag may be tampered with in many



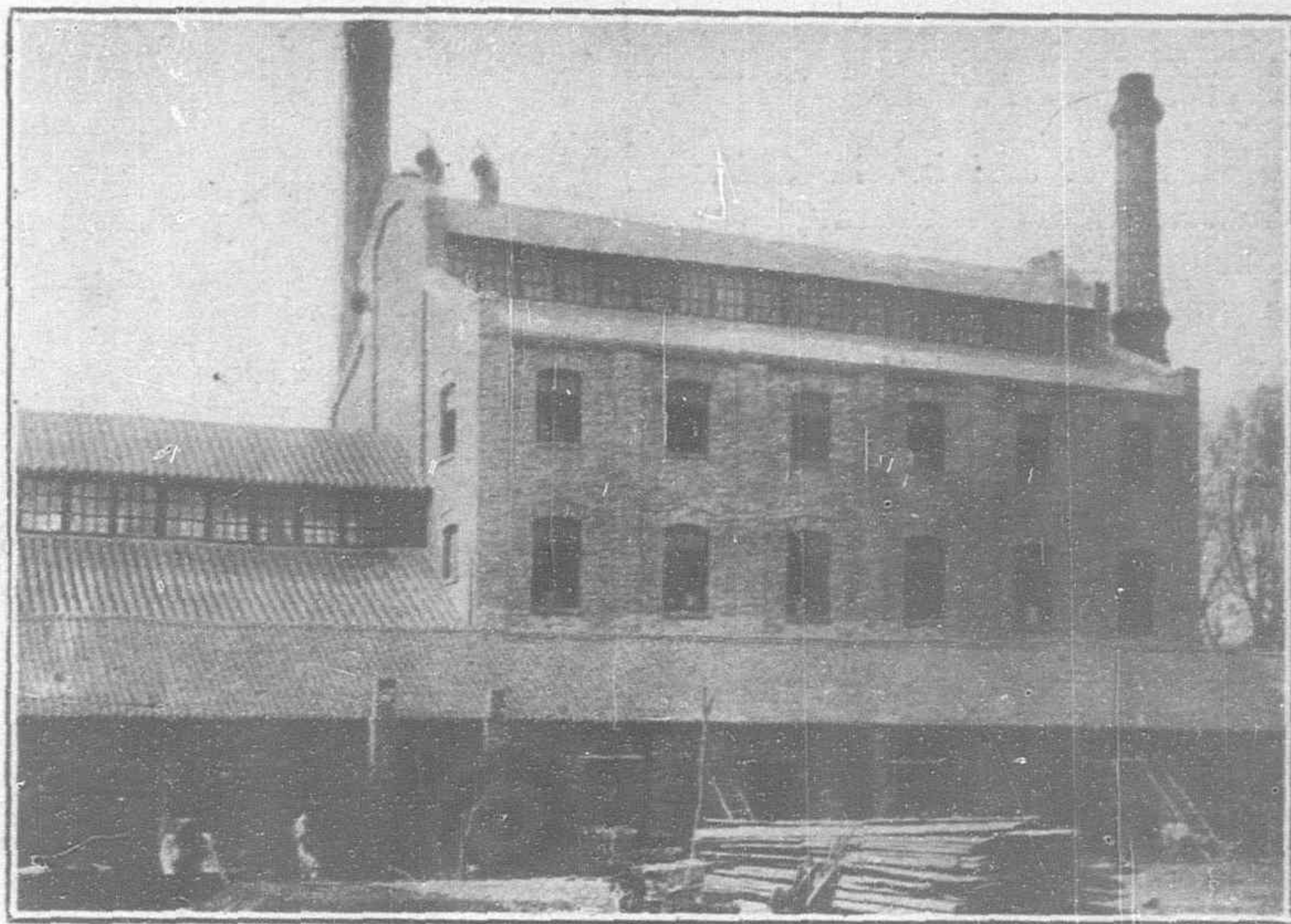
Mow Sing Flour Mill—Mill No. 1, Wusih, Kiangsu Province.
Capacity, 5,800—50-lb. bags per day



Old Fu Hsing Flour Mill (burned down December 1922), Tientsin, Chihli Province. Capacity, 4,700—50-lb. bags per day



Tien Hsing Foh Flour Mill—Mill No. 1, Changchun, Kirin.
Capacity, 3,000—50-lb. bags per day



Foong Nien Flour Mill, Tsinanfu, Shantung Province.
Capacity, 5,000—50-lb. bags per day

ways, such as, taking out a few pounds, emptying a No. 1 quality flour bag and substituting No. 2 quality flour and then selling this cheaper, darker flour for the price of the better quality, a practise always detrimental to the good name of the mill's products.

Mr. Chang is one of the few managers in China to recognize the importance of not only keeping his fine new plant up to maximum efficiency, but of turning out a first-class flour of uniform strength and quality. To ensure this he placed his mill from the time the machinery was ordered under the able supervision of one of Fobes Company's flour mill engineers, Mr. Wallace Larson. Since the mill started operation in March of this year, it has turned out a flour that for whiteness, purity and strength is difficult to equal in all North China. From almost the first day Fu Hsing brand flour has been sold on the Tientsin market for 5 to 15 cents more a bag than any other flour. Based on a daily output of 5,800 bags, at only 10 cents extra per bag, efficient supervision would seem to be well worth while.

Handling of Wheat in China

To those not familiar with the manufacture of flour, a brief explanation of the system employed in one of these modern mills of China might be of interest, also the methods of getting the wheat to the mill.

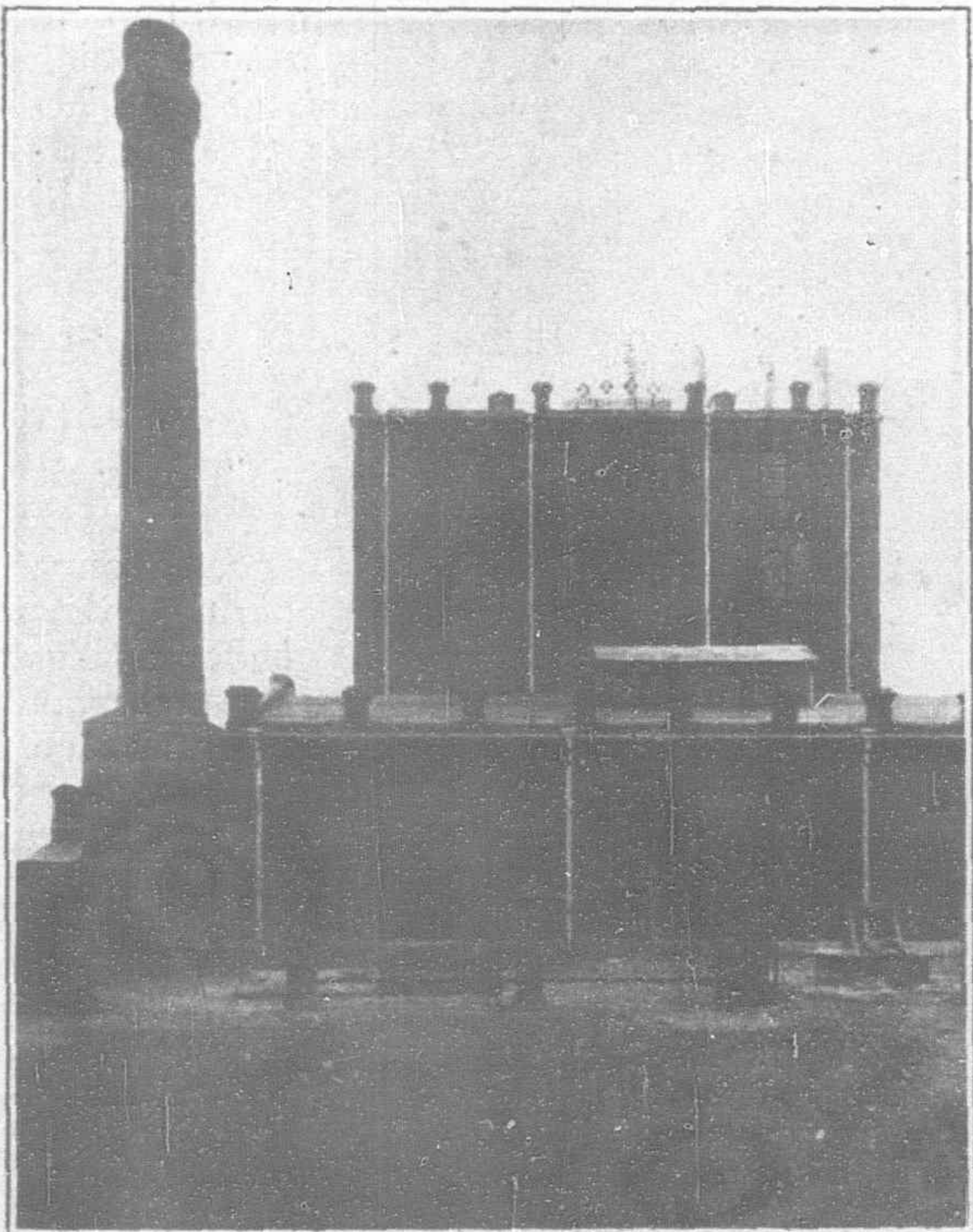
Although the machinery and general equipment inside the mill building proper is as modern as any in the world, the methods of handling the wheat in China from the time it is cut until the time it goes into the first cleaning machine of the mill's system, are very different.

In America, for instance, no up-to-date flour mill would be built without a grain elevator adjacent for

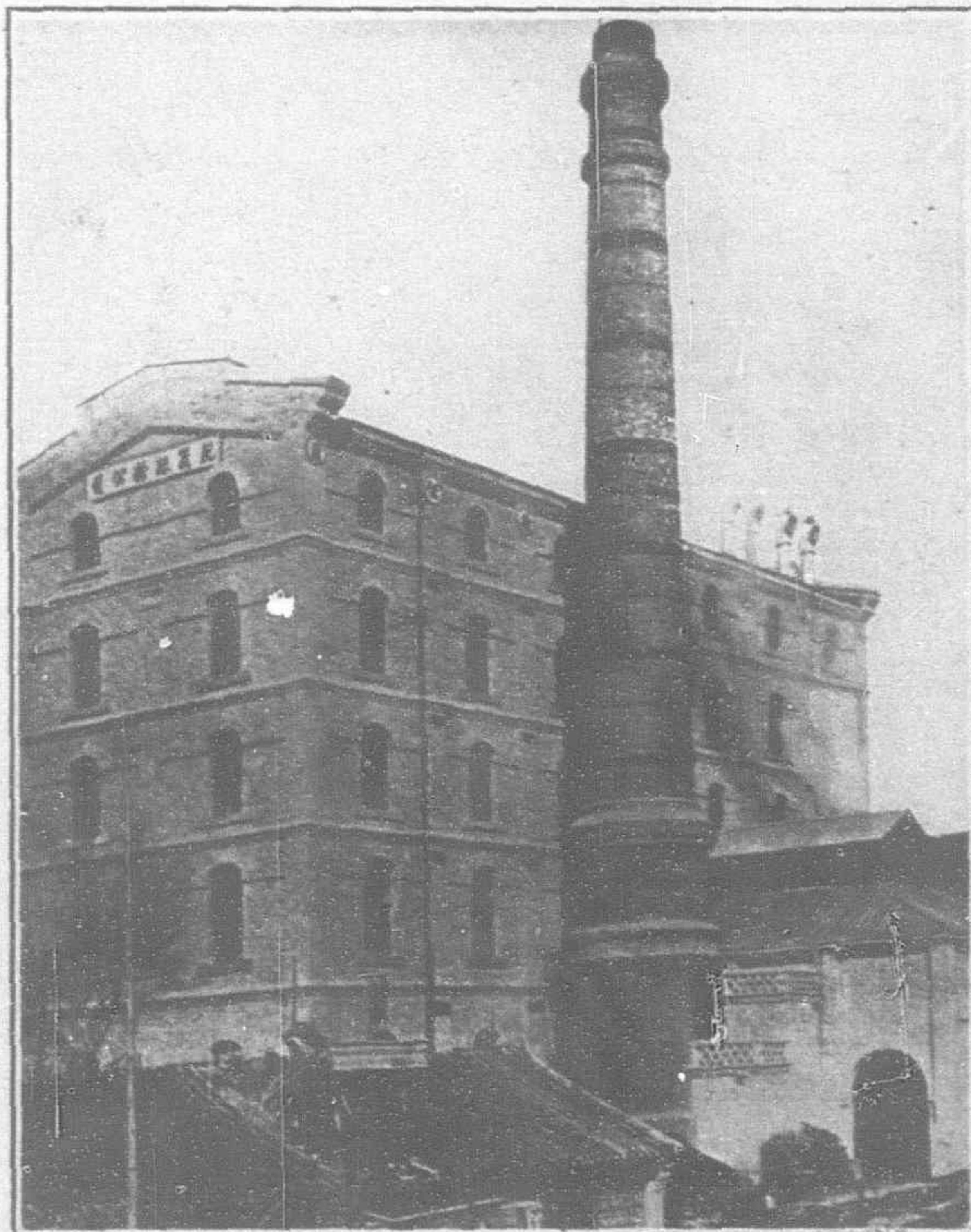
adequate wheat storage, and equipped with complete machinery for elevating, conveying and cleaning the wheat by mechanical means. In rural communities, if the wheat comes to the mill's elevator by farm wagon or motor truck, it is driven upon a platform scale, the whole load of several tons is weighed in an instant, the bags are emptied into a hopper by the driver. The empty conveyance is again weighed and the owner given credit for the net weight of wheat. After the wheat is dumped from the wagon bed into the hopper (if from a railroad car the process is the same) it is conveyed and elevated to the mill's large storage silos entirely by machinery, and one man will check in hundreds of tons of wheat in a day. From the time the bags are dumped into the hopper the wheat is handled entirely by machinery, until it is turned out as flour and its by-products. Quick, efficient and economical methods had to be developed in America where wages are high.

In China for the most part, the ancient methods of harvesting the grain by hand, threshing with flails, mules, and big stone rollers on a threshing floor, the winnowing of the grain by throwing it up into the air and letting the wind blow the chaff away, are practically the same to-day as a thousand years ago! The grain is delivered to the mill, if by land, in Chinese wheelbarrows, two wheeled carts

drawn by oxen, buffalos, donkeys, horses or mules, and sometimes even on wooden sledges. If there is a canal available, delivery to the mill is by sampan or junk. If the junk or sampan is water-tight the wheat may be handled in bulk and on the arrival at the mill it is passed up in baskets from hand to hand to the loading wharf where it is put in bags furnished by the mill company. More



Chen Chong Flour Mill, Tsi-tsi-har, Manchuria.
Capacity, 1,000—50-lb. bags per day



Chen Nee Kung Flour Mill, Paotingfu, Chihli Province.
Capacity, 3,400—50-lb. bags per day

generally, however, it is handled in bags from the farm to the mill.

On first arriving in China the writer was taken through the flour mill district. Accustomed to modern flour mills in North and South America where every five to eight storey flour mill building has its grain storage elevator towering equally high alongside, the flour mills in China always seem incomplete. But passing within the compound walls one sees a whole brood of low one storied godowns. Inside of these godowns every day in the year one sees a small army of coolies, each sweating and grunting under an enormous bag of wheat. One long line is coming from a big junk out in the canal two or three hundred yards distant, and they are stacking these bags into a huge pile that finally reaches to the rafters of the godown. On the other side of this godown another group of coolies is tearing down another huge pile of sacks and "dog trotting" with their burden of wheat into the cleaning department of the mill, perhaps 100 yards distant. A newcomer to the Orient is simply amazed at the swarm of coolies.

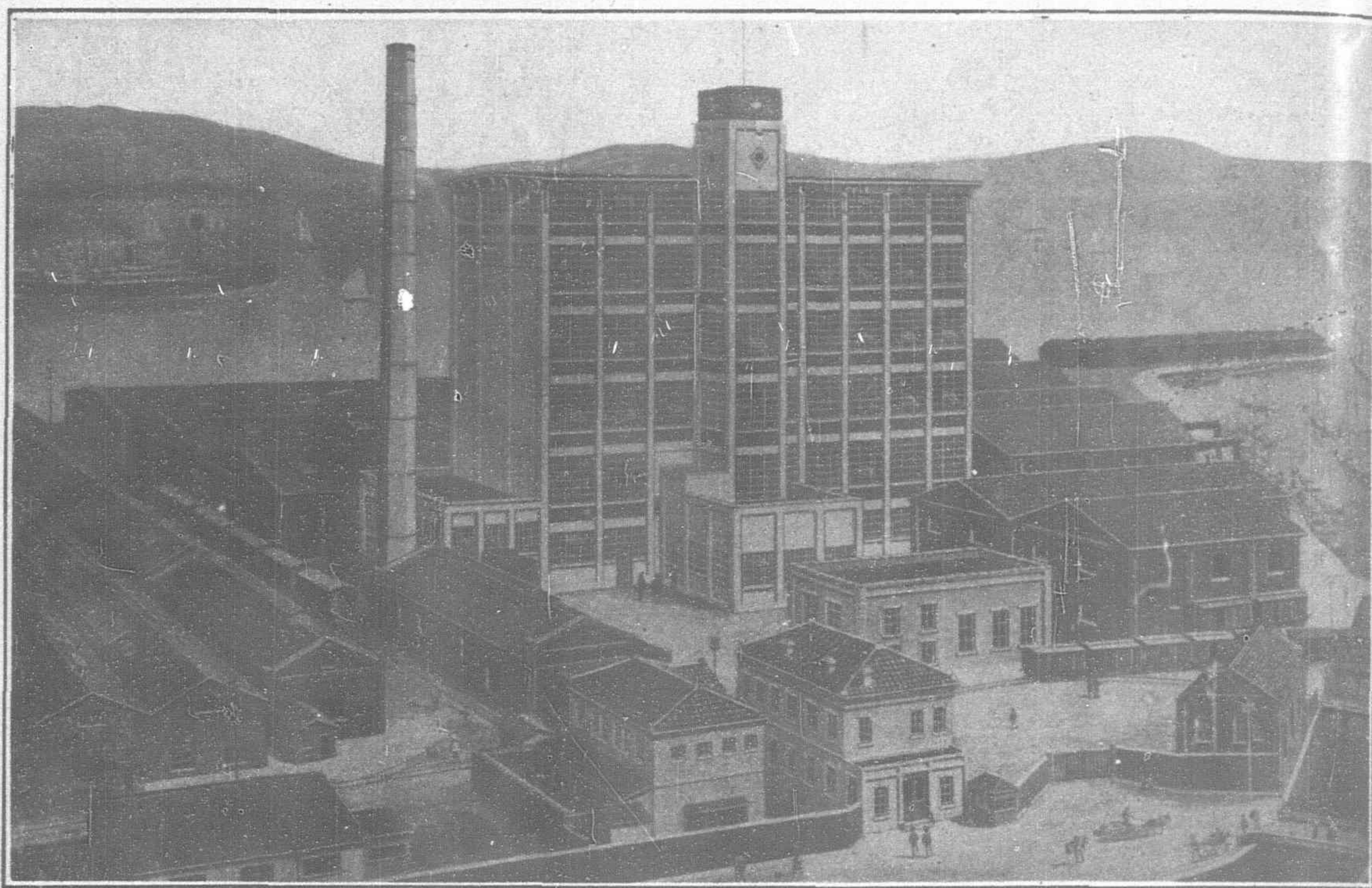
A 1,000 barrel flour mill in America is operated by a total of 20 to 30 workmen who man both the elevator and the mill and the use of 130 to 160 men to do the same work in China seems almost like criminal waste. In America an efficient mill superintendent will spend hours trying to cut down labor and operating costs to a minimum, whereas in China a flour mill frequently seems to be considered a sort of benevolent institution where a place must be found for all of the poor relatives of the directors, manager, sub-manager, superintendent, and so on. For instance, after a brief

survey of a flour mill that was reported to be having hard sledding, a recommendation was made to the manager and mill superintendent where, by a few changes in their wheat receiving bins which meant increasing the capacity, they could do away with the services of twenty coolies. This mill had been installed under the supervision of a Chinese coolie miller, who had convinced the manager that he was an expert in these matters, but due to oversight on his part in not providing adequate receiving bin storage, that mill had been hiring sixteen coolies at a cost of over \$200 a month for four years, to keep these bins full. There was plenty of room available and a sketch was made out with full directions in Chinese giving the necessary data. Four months later when asked why the scheme had

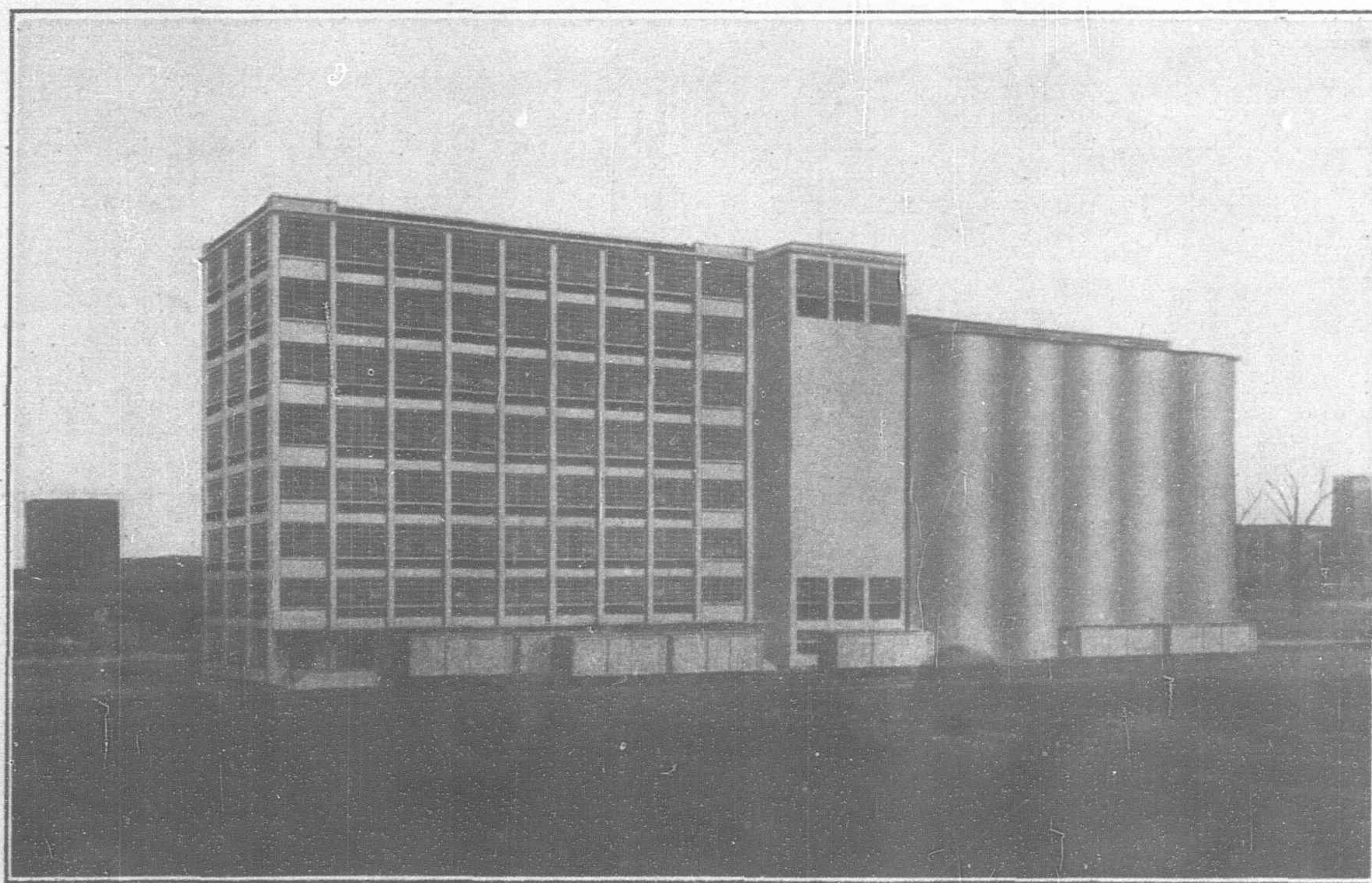
not been carried out as planned, the manager explained that the poor coolies needed the work and that he felt it his duty to do his part by keeping them on—otherwise they would starve. Yet he was complaining of high operating cost of his machinery. The fact remains that this mill worked 80 men in the mill and 28 in the office to carry on a business that in America is done with a total of 16 men.

Chinese Wheat

Taking it as a whole, a great deal of the Chinese wheat is as good as any wheat in the world, but due to the primitive methods of harvesting with flails and stone rollers, and also due to the accumulation of foreign materials *en route* to the mill, Chinese wheat as actually received at the mill contains the highest percentage of foreign matter of any wheat in the world. Regarding the "accumulations *en route* to the mill" this takes place in various ways peculiar to China. In some cases, weed seeds, fine gravel and dirt is added to the wheat by the local guilds of wheat buyers who thus derive an illegal profit. In other cases a large junk will be



The Dai-ichi Flour Mills at Dai-ichi, near Moji, Japan. Capacity, 3,000 barrels wheat flour per day of 24 hours



A MODERN AMERICAN FLOUR MILL ERECTED BY NORDYKE & MARMON CO.

Larrabee Flour Mill, St. Joseph, Mo., U.S.A. Capacity, 25,000—50-lb. bags per day

Here are shown the 8-storey Mill Building, the separate Wheat Cleaning House, and the Grain Storage Silos of a typical mill in the United States. All wheat is handled in bulk. The Silos have a capacity adequate to supply the mill for many months. This plant is designed along scientific lines that permit the daily handling of enormous quantities of both wheat and flour, and with the minimum amount of labor.

loaded with a cargo of wheat in bags and consigned to some mill or godown several hundreds of miles distant. The one in charge is not provided with any money to pay taxes, consequently when he is stopped at various likin stations along the route and a tax exacted, he pays it in wheat. However he is expected to deliver a certain number of bags of wheat of a certain weight to the mill at destination. So a stop is made at certain points a little past the likin station, or at the station itself, where convenient piles of fine rock, gravel and worthless seeds are to be found. But he always delivers his cargo complete and even sometimes, a little over weight. Due to the high percentage of trash in this wheat as received at the mills, the system of cleaning machinery as specified for flour mills in China is very elaborate, and generally speaking, includes twice as many machines as are required for mills in America.

Cleaning and Preparation of the Wheat

The uninitiated may well wonder why a flour mill of any size is always from 4 to 8 storeys high. Take for example an 800 barrel wheat flour mill. The system is quite long and complicated and a total of from 80 to 90 different machines are required to clean the



CORN AND WHEAT FLOOR MILL—Hand Power

Before grinding, in the case of corn, the grain is placed in a large earthenware jar and immersed in water from 12 to 18 hours.

The lower grinding stone is stationary. The upper stone, which has an opening in the centre to admit the grain, is turned by two coolies. The ground product oozes out between the stones and falls on the circular table, from where it is scooped up and emptied into hand sieves clothed with bolting cloth made from horsehair. For a primitive mill, this one is somewhat elaborate, as when grinding corn, the grain is ground and sifted three times before the desired fineness is obtained.

The finished product, being very damp, will not keep but three or four days, so this highly perishable product must be disposed of as quickly as possible.

wheat and convert it into flour, to say nothing of 35 to 40 elevators for the elevation of the products, eight or ten conveyors, transmission machinery, bins and a maze of spouting, wind trunking and other accessories. For a mill of this size American practice in China usually calls for a building 5 storeys high. The cleaning department occupies about one-third of the building, the milling department the other two-thirds, and in each department all five floors contain machinery. A partition wall, or a well between two walls usually separates these two departments, with doors connecting on each floor. In case of a fire in either department this partition serves as a protection. There is always considerable dust in the air of the cleaning department of a mill in China due to the very dirty wheat, and the partition helps to confine this dirt and dust to the cleaning department. In a properly constructed mill, however, this dust can be reduced to a minimum.

On the ground floor of the cleaning department is a wheat sink or receiving hopper where the coolie empties his bag of dirty wheat. This hopper which has a slant bottom discharges into a large capacity elevator by means of which the grain is elevated to the 5th floor and after being weighed in an automatic weighing

machine, is discharged in a steady stream into a preliminary cleaning machine called a receiving separator. In this machine the wheat is aspirated for the removal of light weight impurities, such as dust, chaff, screenings, etc., and passes over a series of sieves with different sized perforations by means of which any impurities either larger or smaller than a grain of wheat are graded out. The dust which is removed by a powerful suction fan is blown into a metal dust collector, and the chaff, screenings, small seed and large trash such as sticks, stones, pieces of coal, etc., are each removed separately in a very efficient manner and spouted to the refuse room down below. From this machine the wheat goes to a large receiving bin. This bin is usually of sufficient capacity to supply the mill with at least enough wheat for a 24 hours run. This bin, like all of the bins in the mill has a slanted bottom, so that when the miller or operator opens a valve the bin discharges itself automatically. It is at this point that the miller takes wheat for the mill as he needs it.

The grain passes by means of a conveyor to another elevator, the second in line for instance, is again elevated to the 5th floor where it is discharged into another separator called a milling separator. This machine is somewhat similar to the first one but arranged with finer sieves and designed to make a much more perfect separation of the foreign materials from the wheat. Four or five different classes of offal are removed by means of this machine also, the lighter weight materials by the suction fan, the others by sieves, and each class comes out separately in the form of sticks, stones, wild peas, corn, etc., wheat screenings, cockle and other fine seeds, chaff and dust. With reference to this last product, the dust, every one of the cleaning machines is connected by means of wind trunking to a separate dust collector. That is, every machine has its individual dust collector which does the work that its name implies, collects the dust. Without these collectors the cleaning department would soon look like the Gobi Desert in a dust storm.

From the milling separator which may be on the 4th floor the wheat drops down through a spout into another cleaning machine on the floor below called a cockle machine. The speciality of this machine is the elimination of small round seeds, smaller than the length of a grain of wheat such as the cockle, mustard seed, and various other small seeds which are present in considerable quantities in most China wheat. The cockle is a very bitter tasting seed which will seriously affect not only the color but the taste of the flour if not eliminated.

From the cockle machine on the 3rd floor the stream of wheat drops down through another spout into another machine on the floor below, called a scourer. Like the two separators mentioned above, this machine is equipped with a powerful suction fan and the stream of wheat on being spread out is subjected to a strong aspiration both on entering and on leaving the scourer to remove dust, chaff, screenings, wheat dust, etc. Inside are cast iron conveyor beaters which convey the wheat through the machine, at the same time subjecting it to a scouring and rubbing action against the slotted uneven surface of the outer case. This knocks loose the dirt in the crease of the grain and scours off the fuzzy hairy beard and branny chips from the outer hull of the wheat. This fine light brown offal is aspirated out of the wheat by the time it leaves the machine. The upright Prinz type of scourer is usually equipped with a gang of magnets which remove nails, bolts and other foreign metallic substances.

If the wheat is dry and brittle, or if it is hard wheat, and too hard to grind as it is, water must be added and after again being elevated to the 5th floor, the grain is delivered to a tempering bin to lie a certain number of hours. The amount of water and the number of hours the wheat is tempered is a point to be decided by the miller. In America or in Europe where flour milling is conducted on a very scientific basis, great stress is laid on the vital importance of proper tempering. It is so vital that improper tempering or the omission of tempering means success or failure in making a pure white flour. In China, there is a tendency among native millers to ignore this important point, which is one of the reasons why nearly all Chinese flour is darker than imported flour. There are other reasons among which might be mentioned the tendency to overcrowd the system. The owners will approach the engineer and ask for machinery adequate to produce 1,000 barrels of flour. Machinery to make that quantity is installed in a system that will make flour of a quality equal to any in the world. These mills are always good for a reasonable overload and would still produce quality flour, but the owners, or the Chinese miller, are not content with a 10 or 15 per cent. overload. They put on coarser

bolting cloth, and overcrowd the machinery to the utmost until they obtain as high as 50 and 60 per cent. overload. Such an overload is not obtained without a corresponding sacrifice in quality.

In the warmer climates where the wheat is comparatively soft, starchy, and with a low gluten content, very little tempering is necessary, but the hard northern wheat should undergo considerable tempering before milling. Volumes could be written on this important subject, which has been only touched lightly in this article.

Assuming that the wheat is to be tempered 24 hours, a bin adequate to contain enough wheat to feed the mill for that many hours would be necessary. This bin is kept full. It has a valve at the bottom and wheat is pouring in at the top at the same rate as it is running out at the bottom.

After tempering, the wheat is usually put through one or two additional scourers. During the tempering process the outer hull of the wheat has been softened and loosened and these two scourers do good and efficient work in scouring and rubbing off these loose particles as well as the beard of the grain.

After passing through the two scourers the wheat goes to a brush machine. This machine is built along the same lines as a scourer except that the wheat passes between several sets of closely adjusted brushes, one fixed and one revolving at a high rate of speed. The stiff bristles of these brushes are designed to give the wheat a last brushing and polishing, and to remove the fine dust from the crease of each grain.

The wheat now passes through a Richardson automatic mill scale, which is set to weigh a half bushel of wheat at each draft. An automatic numbering device on the scale records each draft, and by reading this dial the miller can check up at any hour of the day exactly how many pounds of wheat he is milling per hour. By comparing the reading of this scale with the reading of the scale which weighed the dirty wheat he can ascertain to a pound how much offal has been removed from that wheat by the cleaning department.

The wheat now passes through a pair of wheat steamers where heating or steaming is applied to bring the moisture applied by the tempering to the surface of the hull and toughen it so that it remains tough and does not pulverize on being run through the corrugated break rolls. From the steamer the wheat passes to a small bin and to a wheat governor which automatically maintains a uniform feed of wheat hour after hour, and into the first break rolls for the first crushing.

In the system briefly described, the elaborate preparation of this stream of wheat which we theoretically have been following has required 48 to 50 hours from the time it was dumped into the wheat sink by the coolie. That coolies' hands were the last to touch the wheat. It was necessary for him to cut the bag open, but there is no further human contact or handling in this process. In fact, the manufacture of flour is designed to be one of the cleanest of all as regards the preparation of food for human consumption.

Once the wheat is emptied from the bag into the wheat sink or receiving hopper of the mill, no human hands come in contact with the product until the tightly closed bag is opened, either in the bakery or in your own kitchen, revealing the pure white product that is used for making "the staff of life." The proper preparation and cleaning of the wheat is of vital importance—the essential foundation on which the making of good flour is so dependent.

Looking back over the route the wheat has traveled, flowing by gravity from one machine on the top floor through successive machines on lower floors, it is possible to see the advantages as well as the necessity of having a building several storeys in height. At that, the flow has only been roughly traced through a dozen of the 80 or 90 machines that comprise the mill.

Milling the Wheat

To describe properly the long complicated system of milling the wheat from the time it goes into the first break rolls of the milling department until it is reduced to flour and the by-products of the system would take considerable space, so only a very brief outline will be attempted in this article. Briefly, the process consists of breaking up the wheat on corrugated rolls, separating the heart of the grain, the broken up particles of which are called "middlings," from the hull, classifying and purifying these middlings by means of sifting machines and purifiers, and then breaking down or grinding

these middlings on scratched or smooth rolls, until by a process of gradual reduction all the flour has been separated.

A mill of the size described might have from four to six break reductions which call for corrugated rolls to break up the wheat and gradually remove the interior or heart from the hull, and from 10 to 15 additional reductions or classifications of stocks known as sizings, tailings, middlings and low grades, which call for the use of scratched or smooth rolls.

After each classification has been ground on a pair or pairs of rolls, it drops down through an inclined spout, flowing by gravity to an elevator allotted to that particular stock. This product is then elevated to the fifth floor, discharges into another inclined dust proof spout, and passes to a certain section of a sifting machine. This particular section consists of number of sieves clothed with silk bolting cloth of different meshes by means of which the stock is separated into four or five clean cut classifications of coarse and fine middlings, besides one very fine, white and pure classification which having passed through exceedingly fine mesh silk is known as flour. This stream of flour joins other streams of a similar grade of flour from a dozen other sections and drops down through a spout to the packer on the ground floor. The other classifications of middlings, each being of a different fineness, join with similar stocks from other sifter sections and drop down into a purifying machine on the floor below.

In this machine, which has a long horizontal shaking sieve clothed with silk bolting cloth of different meshes, the middlings are re-sifted and at the time subjected to an aspiration from a suction fan which removes the light brown bits of hull, fibre, dust and other impurities. From this machine the various grades of middlings drop down through a spout to the grinding floor. The coarse middlings all go to one pair of rolls, the medium grade to another, the fine to another, etc. etc. And so the intricate process is carried on, grinding, sifting, elimination of the flour as a result of that grinding, purification and resifting of what is left and again back to the rolls, until after a process of gradual reduction and after having passed through thirty to forty pairs of rolls all of the flour has been completely extracted. This flour is usually graded as No. 2, No. 3 and No. 4. The by-products from the milling department are bran, shorts (fine chopped up bran) and fibre, commonly known at home as "ships stuff." In China this latter, a brown colored product, is passed through a No. 66 mesh cloth and sold as "No. 4 Flour."

The extraction or yield of flour in China is very high, too high really for any other country, as it will run from 77 to 83 per cent. In America, where competition is keen and the consumer's demands for a pure white flour are higher, the usual extraction is 72 to 74 per cent. which is all the white flour that a No. 1 grade of wheat contains by analysis.

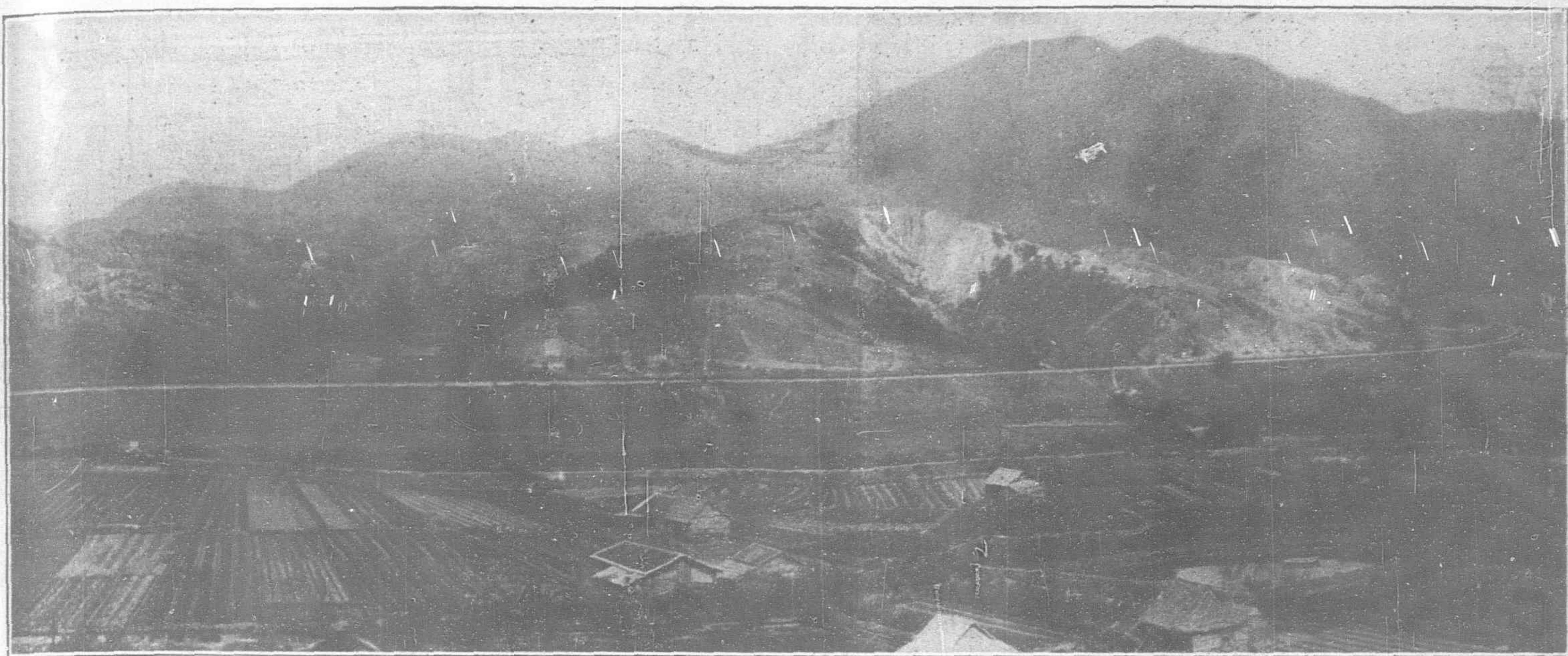
Mill Superintendents

In the flour milling industry in China, the crying need is for competent technical mill superintendents.

During the past ten years, a surprisingly large number of mills have gone up, and the supply of good millers to operate these mills has never been adequate to meet the demand. A competent head miller is not turned out in a day, nor in a year. In America or England, a mill operator has to serve a long apprenticeship of at least four to six years before he is considered fit to serve as second miller. A further period as second miller is necessary before he can become a head miller or superintendent. The flour milling industry has advanced by leaps and bounds during the past quarter of a century, and as its wonderful and intricate system has been developed, a demand has been created for highly trained experts of the finest calibre to man its mills.

We know of one progressive mill owner who has sent two Chinese students of the gentry class to America, where they are taking a four years course in flour milling in one of the large universities. After their four years course is up, they are to spend an additional two years getting practical experience. From such as these we may expect big things in the future, but they are all too few.

In the absence of a proper technical school for training of mill superintendents in China, the next best scheme would be to have more foreign experts from home, who in turn could teach the more clever among the native element, until there are enough competent Chinese millers to carry on the work.



Site for the Kowloon Tong Garden—Developed by the Kowloon Tong Co. and The New Territory Development Co.

Kowloon's Garden City

Builders Delays Hold Up Completion of Mr. Montague Ede's Housing Scheme

SELDOME indeed in this life does a man see his dream come true when it is a dream for himself and even less seldom when it is a dream for others, and this failure of philanthropy to work out is again exemplified in the case of Mr. Montague Ede and his Kowloon housing scheme. Mr. Ede has just retired from his post as general manager of the Union Assurance Society of Hongkong but he has not retired from his overlordship of the housing plan, in fact, he says he intends to finish it despite all and any adverse influences, such as the builders monopoly that now grips Hongkong.

This scheme, known as the Kowloon Tong, had as its objective the furnishing of 250 families with houses at a reasonable rental and amid proper surroundings, homes of which the householders could justly be proud. It was started in 1921 and after arrangements had been made with the government of the colony, applications were invited. Before the first sod was turned, more than the allotted number had applied for the houses. That was two years ago and it was confidently expected that before now the garden city would be in operation. But they reckoned without their host, in this case the builders combine of Hongkong.

In January, says the *China Mail*, Mr. Ede was able to announce that 56 houses would be completed by June, and he expressed his satisfaction at the progress of the scheme. The fifty-six houses would be built on all the land available at the moment. Mr. Ede later cut down his estimate and announced that twenty houses

would be ready in July. The company had met with serious delay from the building contractors—the usual building trouble in the colony, as Mr. Ede characterised it. Mr. Ede said rather sarcastically that instead of having a gang of men working regularly on each house they had “an amah and two boys and even they were always quarrelling.” Mr. Ede pointed out that there was virtually a corner in the building market just now. About half of the building contracts were held by two contractors, who sublet the work to sub-contractors. It was not the actual workers who were causing the delay but the contractors. The guilds were powerful and he implied, almost autocratic.

To the suggestion that workers from outside could be brought in, Mr. Ede said if they were they would have to lock them up in cages and confine them from the rest of the population in order to prevent inevitable trouble they would meet from the local workers. Had the work been carried on steadily from the time it was started, added Mr. Ede, the fifty-six houses would have been ready. There was a striking indication of the delay that had been experienced in the fact that instead of fifty-six houses being ready in July only 20 would be ready. Mr. Ede said he had been trying to communicate with the contractors to speed them up. In spite of the delay, Mr. Ede was assured that by the end of this year, a third of the total scheme would be completed and the remainder in eighteen months' time. This assurance doubtless will be received with gratification by the prospective tenants who “booked” their houses more than three years ago.

China Begins Strawboard Manufacture

(Continued from page 500).

line shaft with a rope drive, supplying power for the straw cutters, rotary digestors, beater engines, Jordans and stock pumps, calendars and paper cutters. One small vertical engine is used for operating a centrifugal pump which distributes water from the creek throughout the plant. The paper machine is driven by a double cone drive from a small vertical steam engine said to be of 50 horse-power.

Most of the machinery is belt driven, the notable exception being the beaters which have rope drive.

Owing to exceptional circumstances a fair estimate of cost of plant and running expenses was obtained from Chinese sources. The plant, including engines and boilers, machinery for making the strawboard and accessories cost approximately Mex. \$270,000. The land cost about Mex. \$12,000, the buildings Mex. \$60,000 and the working capital was about Mex. \$18,000. As this plant was projected some years ago, these prices probably could not be

uplicated now, especially since the paper machine was of Japanese manufacture and much lower in price than a similar one of American or British manufacture would be. At that time the exchange also was low so that a much greater value in machinery was obtained for the money expended.

From the same source a statement regarding the daily operating cost was obtained and while it is probably fairly accurate, some items may have been, and probably were, overlooked. It is as follows : Revenue from 12 tons of strawboard per 24 hours at

Mex. \$100 per ton Mex. \$1,200

Daily Expenses

| | |
|--|------------|
| 18 tons of straw at Mex. \$0.40 per picul .. | Mex. \$121 |
| Lime six piculs at \$1 | 6 |
| Coal, 17 tons at \$12 | 204 |
| Foremen and fitters 20 at \$1 | 20 |
| Laborers 80 at 40 cents | 32 |
| Depreciation of felts (\$3 a ton) | 36 |
| Interest | 120 |
| Salaries and overhead | 161 |
| | <hr/> 700 |

Showing a net profit per diem of Mex. \$500

These figures have been checked so far as possible and appear to be accurate, especially as regards cost of materials and labor, but they are published more as a guide to possibilities than to show the workings of this particular company. The profit of Mex. \$500 a day doubtless will be largely exceeded in countries where coal and labor costs are more advantageous, for it is only \$150,000 for the 300 day year which is barely forty per cent. on the \$360,000 invested.

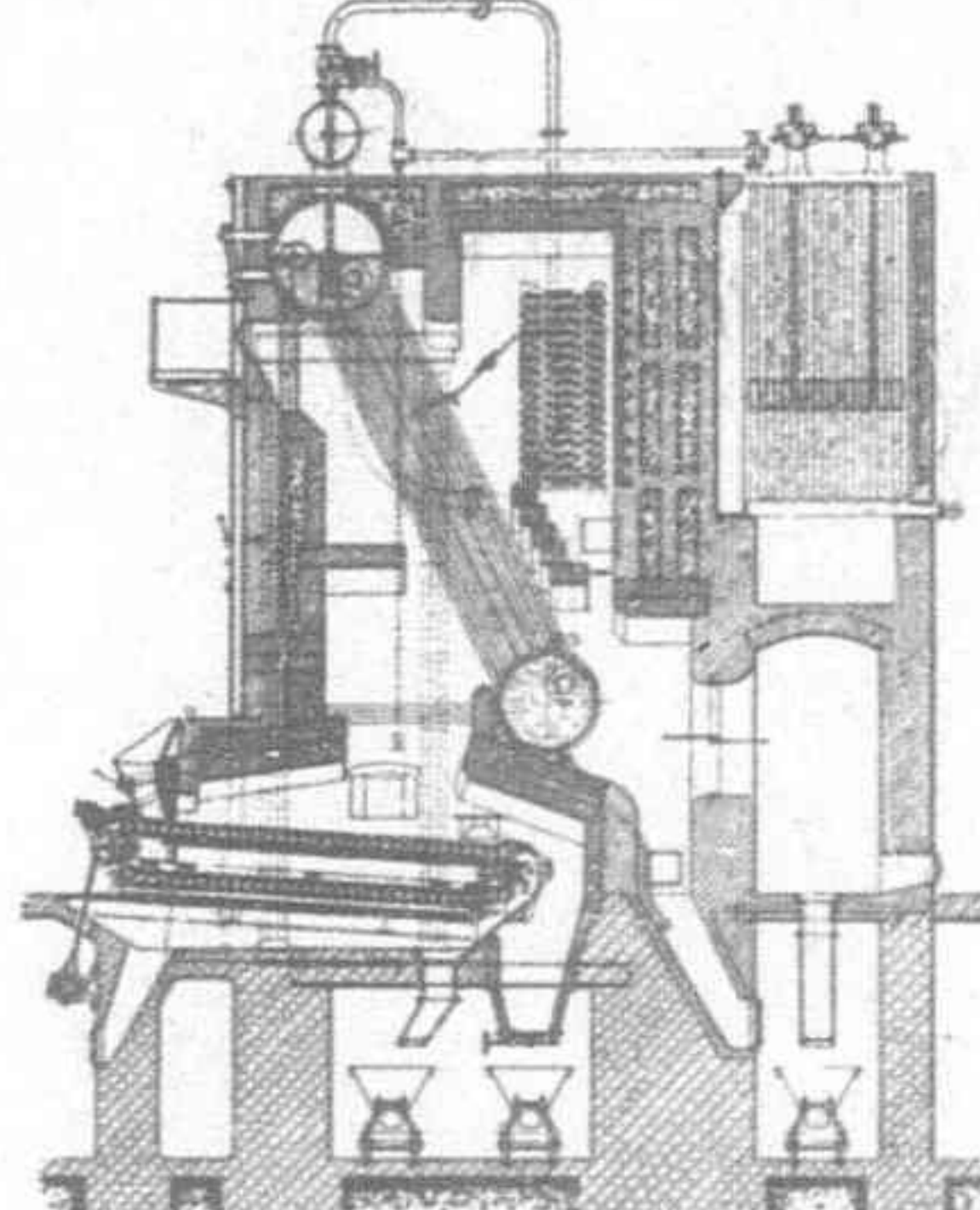
In addition to the two new strawboard mills mentioned above, the Tsung Hwa Cardboard Factory capitalized at \$500,000 fully paid up, has started operation in Tientsin. The plant has a capacity of 14 to 15 tons per day. The company also maintains a selling office in Shanghai.

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Engineering and Industrial Notes

ELECTRIC

ELECTRIC LIGHT FOR KIANGPEI.—

A proposal is afoot at Kiangpei, Szechuen province, for the establishment of an electric light plant under the name of "Yu Pei Electric Light Co." Lu Chao-ching has charge of all preparations. To start with, the plant will be run on a more or less experimental basis, limiting its capacity to 500 lamps.

ELECTRIC POWER IN TIENTSIN.—

The Tientsin chamber of commerce is negotiating with the city electric light company for the use of electric power in the local flour mills instead of animal power.

ELECTRIC LIGHT CO. IN CHEKIANG.—

A new electric light company known as the Wuyi Electric Light Co., has been organized at Wuyi, Chekiang province. The company's stock has been fully subscribed and equipment for an electric plant is to be ordered.

KALGAN ELECTRIC LIGHT CO.—

The electric light company at Kalgan recently installed a new generator to supply the increasing demand of the city. The company's old generator is capable of producing current for 5,000 lamps only. The number of lamps in the city has grown to over 10,000.

ANKING ELECTRIC LIGHT CO.—

Since its management has been handed over to the merchants, the Anking Electric Light Co. has been re-organized and the directors plan to go to Shanghai for the purchase of additional electric machinery.

WATER POWER SCHEMES IN THE F.M.S.—

Messrs. Armstrong Whitworth's experts are at present investigating the large water development schemes connected with the Sungei River, Batang, Badang and Sungei Woh. The total horse power to be obtained from these schemes in their initial stages will amount to about 25,000 h.p.

CEBU PLANT ENLARGED.—

An electric plant, producing current more economically than any other plant in the Philippines, is to be erected by the Visayan Electric Company of Cebu, according to information given out here by the Koppel Industrial Car and Equipment Company. The plant is to be in the form of an addition to the present plant of the Cebu Company and will more than double the present capacity of the Cebu Company's present unit. The Cebu Company has signed a contract with the Koppel Company of Manila for the installation of the new machinery. The main unit will consist of a 550 horse-power stationary Diesel engine connected with a Swedish General Electric Company alternator. The plant will be constructed for parallel operation with the present plant. The Diesel engine to be installed is declared to be the largest which has yet been brought into the islands and will produce current at lower cost than any existing plant.

ELECTRICITY FOR FENGHUANG-CHENG.—

Fenghuangcheng is to have electric lights bringing to fruition a plan conceived in 1916. The promoters are raising a capital of about Y.18,000. Necessary materials have already been purchased at Antung. The new works will start with about 2,500 lamps to be served.

JAPANESE DEVELOPMENT.—

"The future industrial progress of Japan must largely depend on the development of hydro-electricity," said Mr. Keijiro Inouye, president of the Tamagawa Electric Power Co., "and Japan is fortunate enough to own immense resources to develop all the necessary water power to electrify her industries." According to Mr. In-

ouye's own investigation, capital aggregating Y.2,200,000,000 is involved in the hydro-electric development although paid-up capital is estimated at but Y.1,700,000,000. Beside, there is another Y.415,000,000 invested in debentures of different companies engaged in the development of water power which number 500. These hydro-electric development companies are supplying to-day some 3,000 different establishments with power. Of these 500 hydro-electric companies, 295 are paying 10 per cent. and 94 companies 8 per cent. dividends per annum on capital invested, while 109 companies have not so far declared any dividends.

"Some 6,650,000,000 horse-power is developed by hydro-electricity and consumed yearly in Japan for industrial, lighting and transportation purposes," said Mr. Inouye, "and of this, 4,700,000,000 horse-power is utilized in industrial establishments, 1,300,000,000 h.p. in developing 21,000,000 lights which represent 310,000,000 candle powers, and 500,000,000 h.p. in running something like 52,000,000 electric cars on tracks extending 2,000 miles in all."

INDUSTRIAL

NEW CANNING COMPANIES.—

The Chung Hwa Canning Co., Ltd., is being organized in Shanghai to can fruits, vegetables, meat and poultry. It is to be capitalized at \$100,000, to be secured from 5,000 shares of \$20 each. The company's preparation office is at 64 Tientsin Road, Shanghai. Yang Shou-chang and Wu Yu-sung are in charge of promotion. The Tao Hua Canning Company recently established a factory at Wenchow. This plant has a daily capacity of 3,000 tins of meat and vegetables, which are exported chiefly to Amoy.

LEATHER MANUFACTURING CO. IN FOOCHEW.—

The Ta Fu Leather Industrial Co. has lately been established at 9 Front Street, Fan Chu'an Pu Nantai, Foochow. The manager is a returned apprentice from Japan. Manufacturers consist of leather trunks of both Chinese and foreign style, hand bags, cases and boxes for military and naval purposes, toilet caskets and belts, etc.

SOCIETE TEXTILE FRANCO-CHINOISE.—

The Societe Textile Franco-Chinoise has recently been established in Shanghai by Sino-French capital to engage in textile dyeing. The works are to be located on Pai Lien Ching, Pootung, where the company owns a 24-mow site. The town office is at M14 Foochow Road, Shanghai.

A LARGE CONTRACT FOR NEWS-PAPER-MAKING MACHINES.—

Messrs. The Oji Paper Manufacturing Company of Japan, have recently placed an important order for a newspaper-making machine with an English Company, Messrs. Charles Walmsley & Co., Ltd., who are now one of the group of industries controlled by the Armstrong Whitworth parent company.

Messrs. Walmsley & Co., Ltd. are the leading manufacturers of this class of machine in England, having since the war built no less than 30 machines, most of them of huge dimensions and capable of producing a sheet of newsprint 220-in. wide at a rate of 1,000-ft. per minute.

The new machine for the Oji Company will be driven by individual sectional electric motor drive, with patent control to maintain the speeds of the motors absolutely constant.

The value of this contract amounts to some £60,000, and we understand that the same company are now negotiating for a very large machine also destined for Japan, the price for which runs into very much higher figures than the above.

CEMENT PLANT FOR CHOSEN.—

A plan is maturing in Chemulpo for the establishment of a cement factory. Demand for cement is large in Chosen, considerable quantities being required in irrigation and other engineering cement production works. Promoters of the plan claim that their object is to insure self-sufficiency of cement for the peninsula. The proposed factory is to be established at Nekojima and material obtained from Hashu and Kaijo districts, Keiki province, where exist such large beds of limestone that the factory can depend on them operating for some two hundred years to come. A joint stock company capitalised at three million yen will be organized in Seoul to carry on the enterprise. Of its 37 promoters seventeen are Koreans and the rest Japanese.

HONGKONG'S NEW ICE PLANT.—

The Dairy Farm, Ice and Cold Storage Company, Ltd., have just completed the erection of the new ice factory, at East Point which in the matter of equipment probably is superior to anything of its kind in the Far East. In March, 1923, the company contracted with the Hongkong Engineering and Construction Co., Ltd., to remove the old structure and erect an up-to-date reinforced concrete building which cost about \$270,000. It accommodates not only the new ice plant and ice tanks but also has on its top floor two sets of quarters for the resident engineers. Further, it provides us with 260,000 cubic feet of extra refrigerating chambers for storing meats, butter, fruit, etc. The new plant consists of two 80 tons (refrigerating) York machines each driven by a 180 h.p. motor and capable of turning out 80 tons of ice every 24 hours. The company now can produce 150 tons of ice per day and also provides 400,000 cubic feet of refrigerator space, divided into 18 stores for storing various kinds of foods. Messrs. Andersen, Meyer & Co., Ltd., the local agents of the York Manufacturing Company, supplied all the machinery. Connected with the new plant are about 40 General Electric Company motors of various sizes representing about 535 h.p. The whole plant will be run on current supplied by the Hongkong Electric Company. The plant with the necessary accessories cost about \$450,000, making a total cost of \$720,000 for building and plant.

TRAMWAYS

KOBE-OSAKA LINE.—

Plans for a 10-storey terminal building in Osaka and a centrally located terminus in Kobe have been announced by the Hankyu electric line operating between Kobe and Osaka. The Kobe terminus plan, calling for the construction of a two-mile tunnel from the present terminus at Kumochi, just within the city limits, to the heart of the city has been drawn up and authorized by the department of communications. The tunnel will be constructed at an estimated cost of Y.10,000,000. At present the Hankyu terminal in Kobe is at Kumochi about two miles from the business centre of the city and passengers returning from Osaka must take the city tram line to reach the business district, a ride of from 10 to 15 minutes. Elaborate plans for improvements in Osaka are being projected but as yet have not been authorized by the government. The present congestion of traffic between Juso, the junction for the Hankyu branch lines to Sengiyama Takarazuka, and Osaka has become so great that the company plans to add two more tracks from Juso to Osaka. They also hope to complete their plans for a 10-storey terminus building, housing a modern hotel, department store, restaurant, waiting rooms and offices for the company officials. The Hankyu line maintains a 40-minute schedule between Kobe and Osaka with electric trains leaving every four to six minutes during the rush hours in the morning and evening and every five to seven minutes throughout the day.

TRAMCARS FOR NANTAO COMPANY.—Tenders for the supply of 12 tramcars were recently asked by the Chinese Electric Power Company, Ltd., Nantao, Shanghai. The company plans to extend its services between Nantao and Shanghai.

ANTUNG-WIJU STEAM-MOTOR CAR LINE.—The steam-motor car service between Antung and New Wiju across the Yalu railway bridge has been started. The New Wiju-Shahochon (the station next Antung) route will be divided into two sections. The Shahochon-Antung section will form one section, and the Antung-New Wiju, another.

RAILWAYS

PEKING-MUKDEN DOUBLE TRACKING.—Mr. Shui, managing-director of the Peking-Mukden railway, in a petition to the ministry of communications concerning the construction of a new station between Yangtsun and Tientsin, says that as the government had already decided to build a double track for the Peking-Tientsin section of the Ching-Fen line, provision should be made to construct the new station in such a way as to accommodate increased traffic. Mr. Shui urges that the budget for building the station be increased in \$60,000 instead of \$48,000 as sanctioned by the Chiao-tungpu previously.

In connection with this report, information from the Chiao-tungpu says that the government, in view of the increased traffic between Peking and Tientsin, is inclined to accept the proposal of the director for the construction of a double track and that work will commence as soon as funds can be secured.

KAIYUAN-TAOLU LINE.—Referring to the proposed construction of a light rail line between Kaiyuan and Taolu, in the Tungshan (Eastern Hill) district, the tenders for necessary materials have been awarded to the Wato Yoko, a Japanese firm of Changchun.

S. M. R. NEW CARS.—Three new observation cars are under construction at the South Manchurian railway workshops, Shakako. They are for the S.M.R. main line to replace in November next cars now in service, which will then be transferred to the Chosen line.

TELEPHONES AND TELEGRAPHS

PHONE SERVICE FOR LIAOYANG.—The Chinese Telephone Office, Liaoyang, has opened part of the new telephone service installed within the walls to traffic. It planned to throw open the entire system to business from October 1. The Chinese government offices and business houses having relations outside the walls and the railway town continue to make use of the Japanese telephone service, which is thought to be affected but little by the establishment of the Chinese system.

NEGROS P. I. PHONE CO.—Prominent American and Filipino business men in Negros Occidental combined capital to establish the "Negros Telephone and Telegraph Company" in Bacolod, Occidental Negros, has been incorporated with a capital stock of Ps.500,000, divided into 5,000 share at Ps.100 each. Theo. Vail Ralsey, Geo. J. Petty, S. Javier, L. Atotubo, T. Sevilla, R. Barcelona, and J. E. H. Stevenot, who is also the treasurer, are the directors of the new firm. The capital subscribed at the time of its registration amounted to Ps.200,000 and capital paid is Ps.50,000.

CHOSEN-MANCHURIA LINE.—By the end of October, the new Pingyang-New Wiju telephone line will have been completed by the Chosen government. This will supply the last missing link between the through long-distance telephone service between South Manchuria and Chosen, in connection with the Mukden-Antung line installed in December, 1920. On the completion of the through line, traffic will be opened between Mukden and Pingyang and between Antung and Pingyang and Chinnampo.

LONG-DISTANCE SERVICE.—The long-distance telephone between Nantungchow Chungming, and Haimen, Kiangsu province, is now in use.

CHOSEN-MANCHURIA, PHONE SERVICE.—The projected telephone service connecting Chosen and Manchuria is expected to be completed in November, work on the section between Heijo and Shingishu now going rapidly.

HSUCHOW AND HAICHOW LINE.—Seeing that the section of the Lung-Hai Railway between Hsuehchow and Haichow, Kiangsu province, soon will be completed, the ministry of communications has decided to set up a new telegraph line between these two cities. At present messages from Haichow to Hsuehchow or vice versa are despatched via Tsinkiangpu.

NEW LOYANG LINE.—Some time ago, Gen. Wu Pei-fu requested the ministry of communications to instal a long-distance telephone system between Loyang and Kwan-yingtung, exclusively for his use. This service is now in course of completion.

SHIPPING

N.Y.K. ORDERS LINERS.—The Nippon Yusen Kaisha placed an order recently with the Yokohama Dock Company for two new passenger steamers. The new liners are to be placed on the run between Kobe and Shanghai and are to be placed in commission in one year. They are to be of 3,100 tons gross and have a deadweight tonnage of 3,900 tons with a speed of 15 knots. Passenger accommodations will be provided for four in the first cabin and 90 in the steerage.

O. S. K. BUYS NEW SHIPS.—Plans for the material improvement of the Osaka Shosen Kaisha's South American passenger service has been announced as the result of the adoption at the last session of the Diet of the governments policy to concentrate its available energy on the transportation of Japanese emigrants to South America. The Osaka Shosen interests have asked Y.6,500,000 from the Mitsubishi management. It was decided in negotiations that the firm could float debentures to that amount on acceptance by the Mitsubishi Bank. The ships will be constructed at the Mitsubishi Shipbuilding Yard, in Kobe. The keels of the first liner will be laid down in the near future. Debentures will also be floated in course of time. Each ship will have 7,300 tons gross and 12,200 displacement tonnage with a total carrying capacity of 8,400 tons. Each ship will be equipped with refrigeration capable of accommodating 250 tons. The ship will carry 40 cabin passengers and 780 in its steerage. Maximum speed be 16 nautical miles an hour. The service is now cared for by two ships. The completed fleet will consist of five ships. Ten round trips will be made by each yearly. The present trip, requiring 64 days, will be shortened to 45 days. The first ship will be finished in October, 1925, and the second one in February, 1926. The third and last ship will be completed in June, 1927.

S. M. R. CO., NEW COLLIER.—The new S. M. R. collier *Bujun Maru* has been launched at Schiedam, Holland, and will proceed to Dairen under her own steam. The main object of the vessel is to load coal into ocean-going vessels, either inside or outside the harbor, which are not alongside the wharf. Details of the new collier are as follows: Hold capacity, 1,000 tons; fitted with automatic conveyor and self-registering weighing machine; discharge of coal from hold by bunkering ladder and telescopic shoot into bunkers of ships being coaled. The hull is divided into self-emptying hoppers, the bottom of each being equipped with vertically opening sliding doors to communicate with a tunnel on vessel's keel; at bottom of tunnel and further along inclined bunkering ladder, is an endless conveyor to which an endless trough is bolted, divided into series of pockets

by means of upright standing plates; the coal slides through hopper doors into these pockets and before it passes to the inclined bunkering ladder, it is carried over self-registering weighing machines. The vessel is fitted with two vertical compound condensing engines, each developing about 250 I.H.P.

SHIPPING COMPANY IN MANCHURIA.—Authorities in Manchuria are planning to organize a shipping company for the three eastern provinces. The company is to be started under official auspices and to partake of the nature of an official organ. It is to have control over all shipping affairs on the Liao, the Sungari and the Amur rivers. Kwei Sheng, former civil governor of Kirin, has been nominated director of the company.

MINES

GOLD MINING ABOUT AIGUN.—Developments in the gold mining industry about Aigun during 1923 were the brightest feature of the year's trade, says Mr. R. F. C. Hedgeland, commissioner of customs. The gold output was 136,169 troy ounces, valued at Hk. Tls. 3,235,900, of which three-quarters came from the Feng Yuan Gold Mining Company. In 1918 this concern took over two smaller operators, and in 1922 rich deposits were found at Wutakow and Chutuho, where new towns have grown up in the last 12 months. The commissioner says the difficulty of transport over bad roads restricts operations, and the need of a railway to serve the district is becoming urgent.

NEW COLLIERY IN KIRIN.—Last spring, two Japanese of Mukden struck a coal mine at Tashahotzu in Itung, Kirin province. This find is said to be of a considerable magnitude, giving coal of good quality. With several Chinese, they founded a company under Sino-Japanese joint management capital of S.Y.100,000. A gang of 12 Japanese miners, besides 160 Chinese, were put to the work of experimental mining. A layer of coal, about 7-ft. in thickness, has been struck at 35-ft. underground. This seam is reported to extend over a large area, and is said to promise great possibilities. The management has approached the S. M. R. Co., to lay out a coal yard in the railway town of Changtu, and construct a railway for the exclusive use of the new colliery from Changtu station.

COAL WASHING AT FUSHUN.—The foundation work for the new coal washing equipment to be installed at Kuchengtzu mining office of which Mr. T. Onuma, in superintendent, is expected to be finished before winter, and the installation of the machinery will be taken up in April. The machinery has a capacity for washing 16,000 tons of coal in 16 hours. The coal will be improved in quality, but will not be raised in price according to the management which hopes to clear an extra profit by turning out more lump and medium-lump coal.

SPENDS MILLIONS: NO OIL.—After spending approximately Ps.3,000,000 in continued operations in search of oil deposits on Bondoc peninsula, Tayabas, the Richmond Petroleum company, through its local representative, C. T. Newcomb, has made formal announcement of its decision to discontinue drilling activities in the Philippine islands for the present at least. It is the company's intention to surrender all government and private lands and exploratory areas covering the territory now under leases and permits, he said. It is possible that further geological studies will be made of other parts of the islands. According to Mr. Newcomb, the Richmond Petroleum Company has drilled at Bondoc peninsula a total footage of 10,814. The Mugnis No. One was drilled to a depth of 1,323-ft., Sapa No. One 3,757-ft., Pina No. One 5,117-ft., and Yebaan No. 1 617-ft. In gaining this footage slight indications of petroleum and natural gas were encountered, Newcomb declared, but nothing that even nearly approached oil of commercial quantity was found under the structures tested through the wells.